BULLETIN OF MISCELLANEOUS INFORMATION No. 3 1939
ROYAL BOTANIC GARDENS, KEW

XIII—CONTRIBUTIONS TO THE FLORA OF SIAM.

ADDITAMENTUM LI.* NEW AND RE-NAMED SIAMESE ACANTHACEAE.

J. B. IMLAY.

NELSONIEAE.

Staurogyne argentea *Wall.* var. **breviaristata** *Imlay*, var. nov., a typo bracteis sepalisque mucronatis nec longe aristatis glabris 2 mm. latis differt.

SURAT. Langsuan, Pato, c. 100 m., in bamboo forest, *Kerr* 12171 ! (*type*). PUKET. Ranawng, Kao Pawta Chongdong, c. 600 m., in evergreen forest (*Kerr*) *Nai Noe* 17523 !

Staurogyne punctata *Imlay*, sp. nov., a *S. brachystachya* R. Ben. foliis subtus punctatis et glabris usque 5 cm. longis, racemis multifloris saepe basi ramosis minute pubescentibus, bracteis 5–7 mm. longis, calycis lobis inaequalibus oblongis obtusis recedit.

Caules erecti, teretes, lignei, saepe ramosi, primo pubescentes, demum glabri. *Folia* lanceolata vel anguste elliptica, ad apicem subacutum attenuata, basi cuneata, vel breviter attenuata, superiora aliquando alterna vel subopposita, exsiccata supra fusco-viridia subtus pallidissima, supra glabra, subtus sparse pubescentia et punctata, 4·5 cm. longa, 1–2 cm. lata, costa compressa nervisque lateralibus arcuatis utrinque 6–7 conspicuis, margine subintegro subrecurvato, petiolo 0·5–1 cm. longo subglabro suffulta. *Racemi* terminales et ex axillis superioribus orti, 4–6 cm. longi, basi saepe ramosi vel bini, minute pubescentes ; pedicelli 0–1·5 mm. longi ; bracteae oblongae vel ellipticae, obtusae, glabrae, virides, nervosae, 5–7 mm. longae, 1·5 mm. latae ; bracteolae 4 mm. longae, bracteis similes sed angustiores et apice minus obtusae. *Calyx* 9 mm. longus, glaber, extus albo-punctatus ; lobi subaequales, 3 postici 8 mm. longi, 1 mm. lati, oblongi, subobtusi, 2 antici 5 mm. longi, angusti, lineares, acuti. *Corolla* candida (ex *Kerr*), extus glabra, 1·4 cm. longa ; tubus supra basin sensim ampliatus, intus pubescens ; lobi 2 mm. longi. *Stamina* 4, cum staminodio minuto 3 et 4 mm. supra basin corollae affixa, 5·5 et 7 mm. longa, apice breviter glanduloso-pilosa ; connectivus expansus, biramosus, glandulosus ; antherae loculi divergentes. *Ovarium* glabrum ; stylus 11 mm. longus, glaber.

UDAWN. Lôi, Kao Krading, c. 1200 m., by stream in open forest, *Kerr* 20094 !

* Continued from K.B. 1938, 454.

Staurogyne dispar *Imlay*, sp. nov., a *S. subglabra* C. B. Clarke foliis exsiccatis pallidis, floribus haud secundis basi spicae subsessilibus, sepalis inaequalibus postico ceteris multo majore differt.

Caules basi prostrati et radicantes, demum erecti, primo glanduloso-puberuli, mox glabri. *Folia* opposita, aliquando subaequalia, lanceolata, ad apicem subacutum attenuata, basi subito breviter attenuata, chartacea, supra et nervis subtus minute viscido-pubescentia, 4–8 cm. longa, 1·6–3·2 cm. lata, costa supra conspicua subtus compressa subprominente, nervis lateralibus utrinque 6 subtus conspicuis intra marginem subintegrum anastomosantibus, petiolo 1·5–3 cm. longo puberulo suffulta. *Spicae* terminales, 2–5 cm. longae, floribus haud secundis basi subsessilibus ; pedunculus 1 cm. longus, basi folia parva gerens ; bracteae calyce longiores, ellipticae, apice subacutae, virides, basi albae, 1·2 cm. longae, 4·5 mm. latae, glabrae, nervosae, extus apice albo-punctatae ; bracteolae 4 mm. longae, lineares, glabrae, apice virides. *Calyx* extus basi minute puberulus ; lobi intus glabri, apice virides, nervosi ; posticus oblongus, acutus, 9 mm. longus, 3 mm. latus ; 2 anteriores angusti, lanceolati, 6 mm. longi, 1 mm. lati ; 2 laterales 3 mm. longi, 0·5 mm. lati. *Corolla* candida (ex *Kerr*), extus glabra, 2 cm. longa ; tubus 3 mm. supra basin ampliatus. *Stamina* 3 mm. supra basin corollae affixa, 1 et 1·2 cm. longa, breviter pilosa, apice pilis glandulosis densioribus ornata ; connectivus biramosus ; antherae loculi divergentes. *Ovarium* glabrum ; stylus 1·7 cm. longus, glaber ; stigma bilobatum, lobo altero in duos ramos patentes diviso.

Payap. Doi Pepo, Mê Hawng Sawn, c. 800–1000 m., common in evergreen forest, *Kerr* 6178 !

The largest pair of leaves is nearest the apex, and in more than one case a smaller pair of leaves alternates with a larger pair.

Staurogyne cuneata *Imlay*, sp. nov., a *S. longispica* Ridley foliorum nervis lateralibus utrinque 8 superne arcuatis subtus pubescentibus, spicis terminalibus multo brevioribus, pedunculo 1 cm. longo, bracteis majoribus differt.

Caules tenues, basi prostrati, demum erecti, primo pubescentes, mox glabri. *Folia* ovato-lanceolata, elliptica, ad apicem subacutum breviter acuminata, basi cuneata, supra glabra, subtus nervis pubescentia, exsiccata subnigra, 5·5–11·5 cm. longa, 2–5 cm. lata, costa supra conspicua subtus prominente, nervis lateralibus utrinque 8 subtus conspicuis superne arcuatis, margine subintegro, petiolo 1·5–2 cm. longo pubescente suffulta. *Spicae* plerumque terminales, solitariae, simplices, 2–6 cm. longae ; pedunculus 1 cm. longus ; bracteae late ovatae, obtusae, glabrae, exsiccatae brunneo-nigrae, 7–13 cm. longae, 4–8 mm. latae, inferiores majores, brevissime petiolatae, obscure 3-nervosae ; bracteolae lineares, 3 mm. longae, glabrae ; pedicelli c. 1 mm. longi. *Calyx* 3·5 mm. longus, extus glaber ; lobi subaequales : posticus longior latiorque, 3-nervosus ; ceteri anguste lineares, acuti, intus glabri, glanduloso-punctati.

Corolla subrosea (ex *Kerr*), 1·5 cm. longa, extus glabra ; tubus 3 mm. supra basin ampliatus, intus infra stamina pilosus. *Stamina* 3 mm. a basi corollae affixa, 5 et 8 mm. longa breviter pilosa, superne glandulosa ; connectivus expansus, breviter glandulosus ; antherae loculi ovoidei, horizontales. *Ovarium* glabrum ; stylus 11 mm. longus ; stigma bilobatum, lobo altero biramoso.

RACHABURI. Prachuap, Kao Luang, c. 800 m., in evergreen forest, *Kerr* 10811 ! SURAT. Chumpawn, Kao Tung, c. 700 m., in evergreen forest, *Kerr* 11534 ! (*type*).

RUELLIEAE.

Synnema biplicatum (*Nees*) *Imlay*, comb. nov.

Adenosma biplicata Nees in Wall. Pl. As. Rar. **3,** 79 (1832).

Pedicularis avana Wall. ex Benth. Scroph. Ind. 52 (1835).

Synnema avana (Wall. ex Benth.) Benth. in DC. Prodr. **10,** 538 (1846).

Cardanthera avana (Wall. ex Benth.) Benth. ex C. B. Clarke in Hook. f. Fl. Brit. Ind. **4,** 405 (1884), etc.

Hygrophila salicifolia (*Vahl*) *Nees* var. **quadrivalvis** (*Buch.-Ham.*) *Imlay*, comb. nov.

Ruellia undulata Vahl, Symb. Bot. **3,** 82 (1794).

Ruellia (?) or *Hygrophila quadrivalvis* Buch.-Ham. in Trans. Linn. Soc. **14,** 291 (1825).

Hygrophila quadrivalvis Nees in Wall. Pl. As. Rar. **3,** 80 (1832).

Antirrhinum molle Blanco, Fl. Filip. 503 (1837).

H. undulata (Vahl) Nees in DC. Prodr. **11,** 91 (1847), partim.

H. obovata Nees sec. Wight, Ic. **4,** pt. 4, expl. p. 18, t. 1489 (1849), non Nees.

H. angustifolia var. *quadrivalvis* (Buch.-Ham.) Williams in Bull. Herb. Boiss. sér. 2, **5,** 435 (1905).

H. angustifolia var. *assurgens* (Nees) C. B. Clarke ex Williams, l.c., tantum quoad specim. Siam.

Hygrophila stricta (*Vahl*) *Lindau* var. **siamensis** (*C. B. Clarke*) *Imlay*, stat. nov.

Nomaphila siamensis C. B. Clarke in Bull. Herb. Boiss. sér. 2, **5,** 716 (1905).

Hygrophila intermedia *Imlay*, sp. nov., ab *H. episcopali* (R. Ben.) R. Ben. (e descr.) foliis integris 2 cm. longis, bracteis haud oppositis calyce corolla capsulaque minoribus, bracteolis nullis, facile distinguenda.

Caules usque 40 cm. alti, lignei, basi prostrati, glanduloso-pubescentes. *Folia* parva, opposita, anguste oblongo-elliptica, et apice et basi obtusa vel subacuta, lineolata, utraque pagina subtomentosa, usque 2 cm. longa, 0·5 cm. lata, costa nervisque obscuris, margine integro pilis multicellularibus et glandulosis ciliato, petiolo c. 1·5 mm. longo suffulta. *Flores* 1–4, subsessiles, in fasciculis parvis axillaribus cymosis dispositi, pedunculo 1–2 mm. longo

glanduloso-pubescente ; bracteae alternae, 1 mm. longae ; bracteolae nullae. *Calycis lobi* anguste lineares, obtusi, fere usque ad basin liberi, glanduloso-pubescentes, 6 mm. longi, posterior longior et latior. *Corolla* purpurea (ex *Kerr*), extus glanduloso-puberula, 1·2 cm. longa, tubo 7 mm. longo superne ventricoso, limbo bilabiato, labio inferiore plicato. *Stamina* 2 et 4·5 mm. longa, infra faucem corollae affixa, glabra, antherae loculis 1 mm. longis muticis parum divaricatis. *Ovarium* apice minute glanduloso-puberulum, c. 24-ovulatum ; stylus 8 mm. longus, puberulus. *Capsula* apice glanduloso-puberula, 1 cm. longa, oblonga, 24-sperma.

PITSANULOK. Mûang Petchabun, c. 200 m., growing in gravel bed of stream, *Kerr* 5698 !

Ruellia malasica (*C. B. Clarke*) *Imlay*, comb. nov.

Acanthopale ? *malasica* C. B. Clarke in Journ. As. Soc. Beng. **74,** 659 (1908).

Aporuellia axillaris C. B. Clarke, l. c. 650 (1908).

Ruellia subulata *Imlay*, sp. nov., *R. patulae* Jacq. affinis, sed foliis lanceolatis apice acuminatis acutis nec obtusis rotundatisve, bracteolis longe petiolatis obovato-spatulatis, calycis laciniis multo longioribus subulatis, capsula clavato-ellipsoidea nec clavato-globosa, facile distinguenda.

Caules tenues, subteretes, breviter albo-pubescentes, pilis patentibus. *Folia* opposita, subaequalia, petiolata, lanceolata vel oblongo-lanceolata, acuta vel apice breviter acuminata, basi acuta, chartacea, obscure lineolata, pagina superiore et subtus costa nervisque pubescentia, 3–8 cm. longa, 1·5–3·3 cm. lata, costa nervisque lateralibus utrinque 5–6 supra conspicuis subtus prominulis, nervis transversis multis subtus conspicuis, margine integro vel subintegro, petiolo 0·7–1·5 cm. longo suffulta. *Flores* axillares, solitarii, subsessiles, in axillis oppositis ; bracteolae longe petiolatae, obovato-spatulatae, apice obtusae vel rotundatae, calyce breviores, 1–2 cm. longae, fructu maturescente accrescentes, breviter pubescentes, nervosae, petiolo tam longo quam lamina. *Calyx* 11 mm. longus, usque 1·8 cm. longitudine accrescens, extus pubescens, lobis lineari-subulatis pubescentibus basi $\frac{1}{3}$ connatis. *Corolla* purpurea (ex *Kerr* 19760), extus pubescens, 4·5 cm. longa, tubi parte angusta basali quam parte expansa multo breviore, lobis subaequalibus rotundatis. *Stamina* glabra, filamentis 6 et 10 mm. longis, antheris curvatis 3 mm. longis. *Ovarium* glabrum ; stylus hirsutus. *Capsula* 2 cm. longa, glabra, clavato-ellipsoidea, apice breviter acuminata, haud globosa. *Semina* 6–7, in capsulae parte superiore, ovata, compressa, margine dense hirsuta.

RACHASIMA. Korat, Lat Bua Kao, *Put* 4369 ! (*type*). RACHABURI. Rachaburi, c 50 m. low shrub in bamboo forest, *Kerr* 19760 !

Ruellia dissimilis *Imlay*, sp. nov., a *R. prostrata* Lam. bracteolis subsessilibus anguste ellipticis haud spatulatis, calyce fere glabro

lobo postico ceteris longiore, capsula glabra apice globosa 6–8-sperma recedit.

Caules tenues, basi prostrata radicantes, subteretes, pubescentes. *Folia* opposita, subaequalia, breviter petiolata, lanceolata, apice acuta vel subacuta, basi brevissime attenuata, supra lineolata, glabra, costa subtus parce pubescente, 2·5–6·5 cm. longa, 1·5–2·5 cm. lata, costa cum nervis lateralibus utrinque 5 supra conspicuis subtus prominulis, nervis lateralibus saepe intra marginem connexis, nervis transversis subtus conspicuis, margine integro vel subintegro glabro, petiolo 5–8 mm. longo parce pubescente. *Flores* axillares, 1–2-nati, subsessiles; bracteolae anguste lanceolato-ellipticae, apice subobtusae, subsessiles, c. 1·3 cm. longae, 3 mm. latae, lineolatae, nervosae, fere glabrae. *Calyx* 7 mm. longus, extus lineolatus et fere glaber, lobis linearibus breviter acuminatis fere ad basin divisis postico ceteris 1 mm. longiore et 1 mm. lato. *Corolla* alba vel albo-rosea (ex *Kerr*), extus puberula, c. 3 cm. longa, tubi parte angusta basali quam parte expansa multo breviore, lobis subaequalibus oblongis obtusis. *Stamina* glabra, filamentis 6 et 8 mm. longis, antheris 1·5 mm. longis. *Ovarium* glabrum; stylus 1·5 cm. longus, hirsutus. *Capsula* c. 1·4 cm. longa, clavata, apice globosa, glabra pilis paucis brevissimis apice exceptis. *Semina* 6–8, in parte capsulae globosa.

Surat. Ban Kawp Kêp, c. 10 m., in clearing, *Kerr* 13308! (*type*); Yanyao, c. 50 m., in evergreen forest at foot of limestone hill, *Kerr* 19344! Chumpawn, Bang Son, *Put* 1508! Puket. Krabi, Tambon Kao Panom, c. 100 m., in scrub, *Kerr* 19393! Pattani. Banang Sta, c. 50 m., in evergreen forest on limestone, *Kerr* 7305! c. 100 m., in evergreen forest, *Kerr* 7893!

Ruellia hirtella *Imlay*, sp. nov., a *R. Kerrii* Craib, cui affinis, floribus breviter pedicellatis, bracteolis lanceolatis nec spathulatis, calyce subglabro lobo postico ceteris longiore, corolla 2·5 cm. longa differt.

Caules basi prostrati, primo pilis patentibus instructi, demum glabrescentes. *Folia* opposita, subaequalia, petiolata, lanceolata vel ovato-lanceolata, ad apicem acutum breviter acuminata, basi cuneata, lineolata, supra et subtus costa nervisque pilis longis albis mollibus sparse instructa, chartacea, 3·5–9 cm. longa, 1·8–3·8 cm. lata, costa prominula, nervis lateralibus utrinque 4–5 supra conspicuis subtus prominulis, nervis transversis conspicuis, margine subintegro breviter ciliato; petioli subaequales, usque 2 cm. longi. *Flores* et axillares et terminales, saepissime in axillis superioribus, solitarii, brevissime pedicellati nec sessiles; pedicelli 1–2 mm. longi, hirsuti; bracteolae lanceolatae vel lanceolato-oblongae, obtusae, breviter petiolatae, 1–1·3 cm. longae, 5 mm. latae, nervosae, lineolatae, sparse pilosae. *Calyx* 4·5 mm. longus, extus fere glaber; lobi lineari-acuminati, lineolati, basi usque ad tertiam partem connati, postico ceteris 1 mm. longiore. *Corolla* subpurpurea (ex *Kerr*), extus pubescens, 2·5 cm. longa;

tubi pars angusta basalis parte expansa multo brevior ; lobi subaequales, apice fere truncati, 5 mm. longi. *Stamina* glabra, filamentis 3 et 5 mm. longis ; antherae 1·25 mm. longae. *Ovarium* glabrum ; stylus 1·2 cm. longus, hirsutus. *Capsula* ignota.

RACHASIMA. Korat, Kao Sisiat A, Chantuk, 300 m., in bamboo forest, *Kerr* 9092 !

Ruellia siamensis *Imlay*, sp. nov., a *R. ciliata* Hornem. foliis lanceolatis acuminatis, bracteolis calyce longioribus lanceolatis, calycis lobis basi usque ad tertiam partem connatis differt.

Caules quadrangulares, pilis recurvis breviter pubescentes, et pilis longioribus uniseriatis patentibus pilosi. *Folia* opposita, subaequalia, breviter petiolata, lanceolato-acuminata, apice acuta, basi cuneata, supra lineolata, utraque pagina pilosa, pilis uniseriatis basi turgidis, immatura tomentosa, 5–8 cm. longa, 1·5–3·5 cm. lata, costa nervisque lateralibus utrinque 5–6 supra conspicuis subtus prominulis, his intra marginem ascendentibus, nervis transversis subtus prominulis, margine obscure serrulato ciliato, petiolo 5–10 mm. longo dense pubescente suffulta. *Flores* axillares, 1–3-nati, sessiles ; bracteolae foliaceae, petiolatae, lanceolatae, acutae, indumento ei foliorum simili, lamina circiter 2 cm. longa 1 cm. lata, petiolo 5 mm. longo. *Calyx* 2 cm. longus, bracteolis brevior, extus pilosus, pilis uniseriatis ; lobi lineari-subulati, basi costati, usque ad tertiam partem connati. *Corolla* purpurea (ex *Kerr*), extus puberula, 3·5 cm. longa ; pars tubi angusta basalis parte expansa multo brevior ; lobi subaequales, rotundati. *Stamina* glabra, filamentis 7 et 10 mm. longis ; antherae 3 mm. longae. *Ovarium* glabrum ; stylus 2 cm. longus, hirsutus. *Capsula* ignota.

PAYAP. Khun Tan, 700 m., in deciduous jungle, *Kerr* 3075 !

This is described as a new species only because it is distinct enough not to be matched with any other *Ruellia*. The material is just sufficient for the description.

Echinacanthus siamensis *Imlay*, sp. nov., ab *E. Andersoni* C. B. Clarke foliis glanduloso-puberulis nervis lateralibus utrinque 9, calyce 7 mm. longo, paniculis densius ramosis glanduloso-pubescentibus differt.

Frutex usque 2 m. altus (ex *Kerr*). *Rami* tenues, erecti, obtuse quadrangulares, primo glanduloso-pubescentes, demum glabri. *Folia* petiolata, inaequalia, ovato-acuminata, apice acuta, basi inaequaliter rotundata, chartacea, lineolata, nervis basi glanduloso-puberulis exceptis subglabra, 6–11 cm. longa, 3–5 cm. lata, costa supra conspicua subtus basi prominente, nervis lateralibus utrinque 8-9 supra conspicuis subtus prominulis, margine denticulato glanduloso-ciliolato, petiolo 2–2·5 cm. longo dense glanduloso-pubescente et piloso suffulta. *Paniculae* cymosae, laxe ramosissimae, axillares, in paniculam magnam terminalem cymosam collectae, glanduloso-pubescentes ; bracteae angustae, lineares, 2·5 mm. longae, glanduloso-pubescentes ; bracteolae 1 mm. longae.

Calycis lobi 7 mm. longi, oblongi, obtusi, extus lineolati, glanduloso-pubescentes. *Corolla* alba, lobis lilacinis (ex *Kerr*), extus glabra, 1·3 cm. longa ; tubus 11 mm. longus, supra medium ventricosus, palato piloso ; lobi rotundati, 2 mm. longi. *Stamina* 4, inclusa, 1·5 et 3 mm. longa, basi sparse pilosa ; antherae oblongae, muticae, 1 mm. longae. *Ovarium* glabrum, 20-ovulatum ; stylus 6 mm. longus, glaber. *Capsula* glaber, oblonga, 11 mm. longa.

MAHARAT. Nan, Doi Pu Ka, c. 600 m., in evergreen forest by stream, *Kerr* 4944 !

Eranthemum obovatum *Imlay*, sp. nov., ab affini *E. tetragono* Wall. ex Nees foliis brevioribus ovatis vel ovato-lanceolatis, bracteis obovatis apice rotundatis vel brevissime attenuatis, corollae lobis apice truncatis differt.

Herba c. 0·5 m. alta (ex *Kerr*). *Caules* quadrangulares, puberuli, lineolati. *Folia* ovato-lanceolata, ad apicem subacutum attenuata, basi attenuata, lineolata, subtus nervis puberulis exceptis glabra, 7–9 cm. longa, 2·5–3·5 cm. lata, costa supra conspicua subtus prominente, nervis lateralibus utrinque 7–8 prominulis, margine integro paulum recurvato, petiolo usque 2·5 cm. longo puberulo lineolato suffulta. *Spicae* terminales, lineares, 3–5 cm. longae, 1–1·5 cm. latae ; bracteae obovatae, apice rotundatae vel brevissime attenuatae et obtusae, imbricatae, virides, 1·5–1·7 cm. longae, 7–8 mm. latae, pilosae et subtus glanduloso-pubescentes, margine integro glanduloso-piloso-ciliato ; bracteolae 6–7 mm. longae, lineari-lanceolatae, virides, lineolatae, pubescentes. *Calycis lobi* 6 mm. longi, acuminati, basi lineolati, extus apice pubescentes et ciliati. *Corolla* purpurea (ex *Kerr*), extus glanduloso-pubescens, 4 cm. longa ; tubus 3 cm. longus, apice paulo ampliatus, intus glaber ; lobi late obovati, truncati, 9–10 mm. longi et lati. *Stamina* 2 fertilia, basi utrinque cum staminodio 1 mm. longo, glabra ; antherae 2 mm. longae. *Ovarium* apice glandulosum ; stylus 3 cm. longus, superne pubescens. *Capsula* 1·4 cm. longa, apice glanduloso-pubescens. *Semina* in aqua dense pilosa.

RACHABURI. Kanburi, c. 50 m., in mixed deciduous forest, *Kerr* 10126 ! (*type*). Prachuap, Kan Kradai, *Put* 2330 ! Bangtapan, *Put* 1376 ! (?).

Strobilanthes Cusia (*Nees*) *Imlay*, comb. nov.

Ruellia Cusia Ham. ex Wall. Cat. 2386 (1830), nomen.

Goldfussia Cusia Nees in Wall. Pl. As. Rar. **3,** 88 (1832).

Strobilanthes flaccidifolius Nees in DC. Prodr. **11,** 194 (1847).

Ruellia indigofera Griff. Journ. Trav. 237 (1847).

Dipteracanthus (?) *calycinus* Champion in Hook. Kew Journ. Bot. **5,** 133 (1853).

Strobilanthes Championi T. Anders. ex Benth. Fl. Hongk. 261 (1861).

R. indogotica Balfour, Cyclop. Ind. **4** (1873).

S. flaccidus G. Mann, Assam For. Rep. par. 135 (1877).

S. Balansae Lindau in Bull. Herb. Boiss. **5,** 672 (1897).

Although this plant has been known for so long under the name of *S. flaccidifolius*, there is no doubt that *Cusia* is the earliest valid epithet.

Strobilanthes strobilatus *Imlay*, nom. nov.

Endopogon Ridleyi C. B. Clarke in Journ. As. Soc. Beng. **74,** 654 (1908) ; non *Strobilanthes Ridleyi* Merr. (1934).

Strobilanthes apricus (*Hance*) *T. Anders.*, var. **glaber** *Imlay*, var. nov., a typo caulibus glabris pilis paucis nodalibus exceptis, foliis subglabris differt.

PAYAP. Lampun, Mê Kaw, 430 m., in *pê* jungle open grassland, *Winit* 1231 !

Strobilanthes gramineus *Imlay*, sp. nov., ab affini *S. aprico* (Hance) T. Anders. foliis anguste lineari-lanceolatis haud asperis, omnibus partibus glabris recedit.

Suffrutex caespites rotundatos humiles efformans (ex *Kerr*). *Caules* multi, erecti, tenues, glabri, apice sulcati, nodis inferioribus turgescentibus, internodiis inferioribus elongatis. *Folia* opposita, sessilia, anguste lineari-lanceolata vel anguste oblonga, apice acuta, basi obtusa, 5–6 cm. longa, 5–8 mm. lata, glabra et lineolata, coriacea, costa supra depressa subtus prominente, nervis lateralibus utrinque 5 adscendentibus supra conspicuis subtus obscuris, margine integro recurvo. *Inflorescentiae* caulem et ramulos axillares superiores terminantes, capitatae, pauciflorae, glabrae, pedunculis 2–3 cm. longis glabris suffultae ; bracteae exteriores steriles majores, raro caducae, ovatae vel oblongo-ovatae, in apicem oblique acuminatae, glabrae, dense lineolatae, 1·2 cm. longae, 5 mm. latae ; bracteae interiores minores, exterioribus inclusae ; bracteolae oblongo-lineares, obtusae, 10 mm. longae, 2 mm. latae, glabrae, supra dense lineolatae. *Calyx* 10 mm. longus, glaber, bilabiatus, tubo 5 mm. longo ; labium posticum breviter 3-lobatum, lobis acuminatis acutis, lobo medio majore 2 mm. longo ; labium anticum 2-lobatum, lobis oblongis acuminatis acutis glabris lineolatis 8 mm. longis. *Corolla* subpurpurea (ex *Kerr*), extus glabra, 4 cm. longa, tubi parte basali anguste cylindrica 2 cm. longa, parte superiore ventricosa prorsum curvata, lobis subaequalibus obtusis basi constrictis c. 7 mm. longis. *Stamina* 2, 2·3 cm. a basi tubi corollae affixa, filamentis 11 mm. longis glabris, antheris subexsertis oblongis 3 mm. longis ; pollinis grana globosa, papilloso-echinata. *Ovarium* glabrum, loculis 4-ovulatis ; stylus 4 cm. longus, glaber.

NAKAWN SAWAN. Kampêng Pêt, Kao Hua Mot, 700–900 m., on limestone hill, *Kerr* 6118 !

The plant grows in thick low bushy clumps and is very abundant among low grass of savannah ; it sometimes forms nearly pure growth (ex *Kerr*). The ovary is unlike that of other *Strobilanthes* in having eight ovules.

Strobilanthes serratus *Imlay*, sp. nov., a *S. Neesii* Kurz (e descr.) foliis supra glabris minoribus, calyce minore, corolla extus pubescente, seminibus 2 perfectis differt.

Suffrutex usque 3 m. altus. *Rami* quadrangulares, sulcati, sulcis et juventute pubescentes. *Folia* ovata, in apicem acuminata, basi attenuata et in petiolum breviter decurrentia, chartacea, superiora minora, sessilia vel subsessilia, saepe lanceolata, 10 cm. longa, usque 5·7 cm. lata, inferiora longipetiolata, 14–17·5 cm. longa, 6·5–9·5 cm. lata, utraque pagina glabra et lineolata, costa supra conspicua subtus prominente et pubescente, nervis lateralibus utrinque 9–10 conspicuis, nervis transversis multis, margine serrato vel crenato-serrato laevi recurvo glabro. *Inflorescentiae* terminales et in axillis superioribus, paniculatae, 5–8 cm. longae, glanduloso-pubescentes, floribus sessilibus oppositis basi distantibus apice densioribus; bracteae inferiores foliaceae, superiores lanceolatae, acuminatae, nervosae, caducae, calyce longiores, c. 1·8 cm. longae, 3·5 mm. latae, glabrae, costa subtus apice pubescente; bracteolae lineari-oblongae, obtusae, 4·5 mm. longae, 0·75 mm. latae, subtus et margine pubescentes. *Calyx* extus dense glanduloso-pubescens, 6 mm. longus; lobi lineares, obtusi, subaequales, 4–4·5 mm. longi, 0·5 mm. lati, sub fructu 8 mm. longi, apice intus pubescentes, margine integro glanduloso-pubescenti-ciliato. *Corolla* purpurea (ex *Kerr*), extus pubescens, cum pilis paucis glandulosis, 3–3·5 cm. longa, tubi parte basali angusta 8 mm. longa, parte superiore sensim ventricosa 2·3 cm. longa; lobi 4·5 mm. longi, subaequaliter emarginati, glabri. *Stamina* 2 perfecta cum 2 rudimentariis, 2·2 cm. supra basin corollae affixa; filamenta 4 mm. longa, glabra; antherae ovoideae, muticae, 2 mm. longae; pollinis grana subglobosa, longitudinaliter costata. *Ovarium* apice dense pubescens, cristatum; stylus 2·7 cm. longus. *Capsula* 10 mm. longa, apice pubescens. *Semina* 2 perfecta et 2 imperfecta, pilosa.

PAYAP. Doi Chiengdao, c. 1900 m., *Kerr* 6587! forming a thick undergrowth in evergreen forest.

Strobilanthes albo-viridis *Imlay*, sp. nov., a *S. kinabaluensi* Stapf et a *S. Kerrii* Craib foliis basi aequalateralibus, calyce bilabiato viridi et albo glanduloso-pubescente, floribus suboppositis distinguendus.

Suffrutex usque 1·5 m. altus. *Rami* obtuse quadrangulares, puberuli, superne bisulcati, nodis pubescentibus. *Folia* opposita inaequalia, ovata vel elliptica vel ovato-elliptica, apice breviter obtuse acuminata, majora basi breviter attenuata vel cuneata, 7–16·5 cm. longa, 3·3–7·5 cm. lata, minora basi cuneata vel rotundata, 3–6 cm. longa, 2·5–4 cm. lata, utraque pagina glabra et lineolata, costa supra conspicua subtus prominente et puberula, nervis lateralibus utrinque 6–7 conspicuis, nervis transversis multis parallelis, margine subintegro vel serrulato glabro, petiolo 0·3 cm. longo pubescente suffulta. *Spicae* terminales et

axillares, paniculatae, floribus suboppositis basi distantibus apicem versus densioribus et subcapitatis ; pedunculi longi, glanduloso-pubescentes ; bracteae lineari-oblongae, obtusae, 8 mm. longae, 1 mm. latae, apice subtus et supra dense glanduloso-pubescentes, post anthesin caducae, margine dense glanduloso-ciliato ; bracteolae anguste lanceolatae, obtusae, 8 mm. longae, bracteis similes. *Calyx* basi albus, apice viridus, extus glanduloso-pubescens, bilabiatus, 1·2 cm. longus, tubo 2 mm. longo ; labium superius 10 mm. longum, lobis 3 oblongis apice rotundatis 5 mm. longis 1·3 mm. latis, inferius 2-lobatum, 6 mm. longum, 1·5 mm. latum, apice intus dense minute pubescens, margine integro glanduloso-ciliato. *Corolla* purpurea (ex *Kerr*), extus glabra, 3·3 cm. longa, tubi parte basali angusta 6 mm. longa, parte superiore sensim ventricosa 2·2 cm. longa ; lobi obtusi, subaequaliter emarginati, 6 mm. longi, 8–9 mm. lati. *Stamina* 4, 1·2 cm. supra basin tubi corollae affixa ; filamenta longiora 5 mm. longa, pilosa, breviora 1·5 mm. longa, connectivo apice producto et recurvo ; antherae oblongae, 2 mm. longae ; pollinis grana ellipsoidea, longitudinaliter costata. *Ovarium* apice minute glanduloso-pubescens ; stylus 1·6 cm. longus, pilosus. *Capsula* 1·1 cm. longa, minute glanduloso-pubescens. *Semina* hirsuta.

SURAT. Chumpawn, Ta Ngaw, c. 100 m., in evergreen forest, *Kerr* 11493 ! (*type*). CHANTABURI. Krat, Dan Chumpon, c. 100 m., in evergeen forest, *Kerr* 17678 ! PUKET. Krabi, Panom Bencha, c. 700 m., in evergreen forest, *Kerr* 18675 ! NAKAWN SRITAMARAT. Patalung, Klawng Hui Kao, c. 300 m., in evergreen forest, *Kerr* 15286 !

Also found in SUMATRA : Sibolangit, *Md. Nur* 7356 ! This collection was originally referred to *S. hirticalyx* Ridley, by Ridley in Journ. As. Soc. Mal. Br. **1**, 82 (1923).

Strobilanthes suborbicularis *Imlay*, sp. nov., foliis parvis sessilibus suborbicularibus, tota planta foliis supra exceptis glabra exsiccando brunnea coriacea distinguendus.

Caules obtuse quadrangulares, praecipue in angulis pubescentes. *Folia* superiora sessilia, inferiora subsessilia, ovata vel late ovata vel suborbicularia, apice subacuta vel obtusa vel rotundata, basi obtusa vel rotundata, raro subcordata, 2–3·5 cm. longa, 1–2·5 cm. lata, lineolata, supra sparse pilosa, pilis pluricellularibus e basi plana paucicellulari ortis, subtus subglabra, costa conspicua, nervis lateralibus utrinque 4–6 intra marginem serratum ciliatum conjunctis, petiolo 0–2 mm. longo piloso suffulta. *Inflorescentia* axillaris et terminalis, subcapitata, 2–3–5-flora, pedunculo 1·5–3·5 cm. longo sparse piloso suffulta ; bracteae persistentes, ovatae vel obovatae, apice obtusae, basi attenuatae, 5–8 mm. longae, 2–4 mm. latae, glabrae, lineolatae, nervis inconspicuis, margine integro ; bracteolae angustae, oblanceolatae, apice obtusae, 8 mm. longae, 1–2 mm. latae, glabrae, nervis inconspicuis. *Calycis* tubus 2 mm. longus, extus glaber ; lobi oblanceolati, trinerves, subaequales,

apice intus pubescentes, ciliati, 2 anteriores majores, 12 mm. longi, 3 mm. lati, posterior 11 mm. longus, 2 mm. latus, 2 laterales 10 mm. longi, 2 mm. lati. *Corolla* extus glabra, 4·6 cm. longa, tubi parte basali angusta cylindrica 10 mm. longa, parte superiore sensim ampliata ventricosa 2·8 cm. longa ; lobi 7–8 mm. longi, breviter emarginati, glabri. *Stamina* 4, 2·6 cm. supra basin tubi corollae affixa ; filamenta longiora 6 mm. longa, basi pilosa, breviora 1 mm. longa arcuata ; antherae horizontales, ovatae, obtusae, 1·5 mm. longae ; pollinis grana ellipsoidea, longitudinaliter costata. *Ovarium* glabrum ; stylus 2·9 cm. longus, glaber. *Capsula* 1–1·2 cm. longa, glabra. *Semina* 4, ovata, plana, in aqua dense hirsuta.

PAYAP. Chiengmai, Doi Lang Ka, *Put* 3302 !

Strobilanthes Maingayi *C. B. Clarke*, var. **glaber** *Imlay*, var. nov., a typo ramis glabris, foliis ovatis nervis lateralibus utrinque 5–6, bracteis glabris apice dentatis, bracteolis apice dentatis, calyce 1·2 cm. longo lobis apice minute dentatis, filamentis pilosis differt.

RACHABURI. Prachuap, Kao Luang, c. 1000 m., in open evergreen forest, *Kerr* 10835 ! (*type*). NAKAWN SRITAMARAT. Kao Luang, c. 1740 m., in jungle, *Eryl Smith* 744 ! (partly).

Strobilanthes pectinatus *T. Anders.*, var. **acuminatus** *Imlay*, var. nov., a typo ramis glabris, foliis glabris exsiccatis griseis nervis lateralibus utrinque 5–6, petiolo usque 3 cm. longo, bracteis exterioribus apice longe acuminatis usque 3·5 cm. longis interioribus apice dentatis, calycis lobis apice minute dentatis, filamentis pilosis differt.

NAKAWN SRITAMARAT. Kao Luang, c. 900 m., in evergreen forest, *Kerr* 15464 ! May be specifically distinct.

var. **glandulosus** *Imlay*, var. nov., a typo ramis stramineis pilis multis patentibus brunneis multicellularibus glandulosis instructis, foliis exsiccatis subnigris, bracteis basi albis pilis ut rami instructis, calyce scarioso glabro differt.

MAHARAT. Nan, Pu Huat, c. 1500–1600 m., common in evergreen, *Kerr* 4993 !

var. **punctatus** *Imlay*, var. nov., a typo foliis supra densius hirsutis, bracteolis ellipticis obtusis 10–11 mm. longis apice pilosis integris, calyce 11 mm. longo glabro nigro-punctato, filamentis pilosis, capsula 11 mm. longa differt.

PUKET. Satul, Kao Keo Range, c. 600 m., in evergreen forest, *Kerr* 14512 ! (*type*). PATTANI. Kao Kalakiri, 800–900 m., common in undergrowth in evergreen forest, *Kerr* 14954 !

Strobilanthes Evrardi *R. Ben.*, var. **parviflorus** *Imlay*, var. nov., a typo ramis tantum pubescentibus pilis subappressis deflexis, foliis angustioribus lanceolatis supra pilis e basibus parvis tuberculosis ortis subtus densius pilosis, corolla 2·5 cm. rarius 3 cm. longa differt.

Surat. Chumpawn, Ban Tung Maha, c. 10 m., by stream in evergreen forest, *Kerr* 11363 ! Langsuan, Kao Nom Sao, c. 800 m., in bamboo forest, *Kerr* 12074 ! Puket. Krabi, Klawng Wa, c. 50 m., in evergreen forest, *Kerr* 16335 ! (*type*).

Strobilanthes incisus *Imlay*, sp. nov., a *S. venusto* Craib foliis glabris, bracteis angustis, calycis lobo postico ceteris breviore apice emarginato recedit.

Suffrutex 0·5 m. altus (ex *Winit*). *Ramuli* obtuse quadrangulares, sulcati, glabri. *Folia* sessilia, subaequalia, lanceolato-elliptica, ad apicem acutum acuminata, basi attenuata auriculata, lineolata, glabra, 13–20 cm. longa, 3–4·8 cm. lata, costa supra conspicua subtus prominente, nervis lateralibus utrinque 12–13 subtus conspicuis, margine serrulato scabrido-ciliato. *Spicae* axillares et terminales, strobiliformes, 3–5 cm. longae ; bracteae imbricatae, obovatae, apice acutae vel saepe obtusae, basi attenuatae, 10 mm. longae, 5 mm. latae, albo-tomentosae, cum pilis multis glandulosis, subtus pilosae, lineolatae, margine integro pubescenti-ciliato et albo-piloso ; bracteolae 0. *Calyx* 6 mm. longus, extus glanduloso-pilosus ; lobi inaequales, basi 1·5 mm. connati, intus appresse albo-pilosi, glanduloso-ciliati, lineares, obtusi, anteriores 4·5 mm. longi, laterales breviores, posterior brevior apice emarginatus. *Corolla* violacea (ex *Winit*), extus glabra, 3 cm. longa ; tubi pars basalis angusta 6 mm. longa, subito ampliata ; lobi 5 mm. longi, 6–7 mm. lati, obtusi. *Stamina* 4, 1·6 cm. a basi tubi corollae affixa, 1·5 et 6 mm. longa, glabra ; antherae 1 mm. longae, erectae. *Ovarium* glabrum ; stylus 2·5 cm. longus, glaber. *Capsula* ignota.

Maharat. Lampang, Mê Chang, in mixed forest, 400 m., *Winit* 1818 !

Strobilanthes turgidinodis *Imlay*, sp. nov., ob caules succulentos, nodos turgidos, internodia brevia, folia multinervia facile distinguendus.

Frutex sarmentosus, usque 2 m. altus (ex *Kerr*). *Rami* crassi, succulenti, glabri, nodis turgidis, internodiis brevibus. *Folia* elliptica vel oblongo-elliptica, ad apicem acutum acuminata, basi breviter attenuata vel cuneata, exsiccata brunneo-viridia, dense lineolata, glabra, 7–16 cm. longa, 2–5·5 cm. lata, costa nervisque lateralibus utrinque 11–14 supra conspicuis subtus prominentibus villosis, nervis transversis subtomentosis, margine breviter serrato dentibus cristatis ciliato, petiolo 1·5 cm. longo glabro suffulta. *Spicae* 3–8 cm. longae, terminales et axillares, saepe breviter ramosa, brevissime pubescentes et glanduloso-pilosae ; flores sessiles ; bracteae anguste lanceolatae, ad apicem acutum acuminatae, 1·3 cm. longae, 2 mm. latae, glanduloso-pubescentes, margine integro pilis longis et brevibus glandulosis ciliatae ; bracteolae 7–8 mm. longae, 0·8 mm. latae, angustae, acuminatae, glanduloso-pubescentes. *Calyx* 10 mm. longus, extus breviter glanduloso-pubescens ; lobi oblanceolati vel elliptici, acuminati, subaequales,

6–7–8 mm. longi, 1–1·5 mm. lati, intus superne pubescentes, pilis appressis haud glandulosis. *Corolla* purpurea, lobo postico albo- et luteo-maculata (ex *Kerr*), extus puberula, 4 cm. longa ; tubi pars basalis angusta 1·5 cm. longa, demum subito ventricosa ; lobi 6 mm. longi. *Stamina* 4, 2 cm. supra basin corollae affixa, 2 et 6·5 mm. longa, basi pilosa, apice producto recurvo ; antherae oblongae, 1·5 mm. longae. *Ovarium* glanduloso-puberulum ; stylus 3·2 cm. longus, sparse pubescens. *Capsula* ignota.

RACHABURI. Kanburi, Ta Kanun, c. 500 m., on limestone rocks, *Kerr* 10286 !

Strobilanthes argenteus *Imlay*, sp. nov., a *S. recurvo* C. B. Clarke inflorescentia laxa pauciflora, bracteis oblongo-ellipticis obtusis nec ovatis recurvis differt.

Rami obtuse quadrangulares, sulcati, primo pilis longis patentibus albis vel argenteis dense vestiti. *Folia* aequalia vel inaequalia, inferiora ovata vel ovato-elliptica, ad apicem subacutum breviter acuminata, basi brevissime attenuata, longe petiolata, superiora late ovata vel cordata, sessilia, lineolata, utraque pagina pilis longis flaccidis pluricellularibus vestita, maxima 11·5 cm. longa, 6 cm. lata, costa supra conspicua subtus prominente, nervis lateralibus utrinque 6–7 conspicuis, margine crenato ciliato, petiolo 3–3·5 cm. longo suffulta. *Spicae* breves, basi interruptae, laxae, pauciflorae, 1–4 cm. longae, terminales et ramulos axillares e nodis foliorum sessilium cordatorum ortos terminantes ; pedunculi saltem 2 cm. longi, erecti, pilis argenteis patentibus vestiti ; flores oppositi, solitarii, sessiles, basi spicae remoti ; bracteae persistentes, oblongo-ellipticae, obtusae, 7 mm. longae, 2 mm. latae, griseae, extus breviter glanduloso-pilosae, intus pilosae, margine integro glanduloso-ciliato ; bracteolae 5 mm. longae, 1 mm. latae, ceteroquin bracteis similes. *Calyx* 9 mm. longus, extus breviter glanduloso-pilosus, intus apice tantum pubescens, fere a basi bilabiatus ; labium anticum alte bilobatum, lobis 8 mm. longis lineari-lanceolatis acutis, posticum a medio trilobatum. *Corolla* 3·3 cm. longa, extus puberula ; tubus curvatus, basi per 10 mm. angustus, demum ventricosus ; lobi 5 mm. longi, apice oblique emarginati. *Stamina* 4, didynamia, 1·7 cm. a basi tubi corollae affixa, 5 et 7 mm. longa, longiora sparse pilosa ; antherae oblongae, 2 mm. longae. *Ovarium* apice pilis erectis albis vestitum ; stylus 2·4 cm. longus, pilosus. *Capsula* ignota.

PAYAP. Chiengmai, Doi Lang Ka, *Put* 3331 !

Strobilanthes articulatus *Imlay*, sp. nov., a *S. geniculato* C. B. Clarke foliis pilosis minute lineolatis, pedunculis et pedicellis pilosis, sepalis haud glandulosis apice pubescentibus differt.

Rami obtuse quadrangulares, tenues, primo pilosi, demum pubescentes. *Folia* maxime inaequalia, late lanceolata vel ovato-elliptica, ad apicem acutum longe acuminata, basi obtusa vel cuneata, supra minute lineolata, pilosa, subtus nervis pilosa,

majora 7–13 cm. longa, 2·8–4·5 cm. lata, minora saepe caduca, 1–5·5 cm. longa, 1–2·5 cm. lata, costa supra conspicua subtus prominente, nervis lateralibus utrinque 6 utraque pagina conspicuis, margine serrato ciliato, petiolo 7 mm. longo pubescente suffulta. *Spicae* parvae, capitellatae, 2–3-florae, pedunculis longis tenuissimis filiformibus articulatis 6–9 cm. longis saepe ramosis glanduloso-pubescentibus et pilosis suffultae ; pedicelli pilosi ; flores bracteis paucis sterilibus exterioribus ante anthesin caducis inclusi ; bracteae lanceolatae, acuminatae, concavae, 9–10 mm. longae, 4·5 mm. latae, glabrae, lineolatae, margine integro apice ciliato ; bracteolae 0. *Calyx* 7 mm. longus, extus apice puberulus, lobis subaequalibus lineari-lanceolatis 3-nervosis ciliatis. *Corolla* candida (ex *Kerr*), extus alabastro puberula, 3·5 cm. longa ; tubus 5 mm. supra basin ampliatus ; lobi 6–7 mm. lati, apice emarginati. *Stamina* 4, didynamia, 1·6 cm. supra basin corollae tubi affixa, 1 et 6 mm. longa, longiora pilosa, breviora glabra externe curvata ; antherae ovoideae, horizontales, 1 mm. longae, subpurpureae (ex *Kerr*). *Ovarium* glabrum ; stylus 2·4 cm. longus, superne sparse pilosus. *Capsula* 1·6 cm. longa, minute glanduloso-puberula. *Semina* pilosa.

CHANTABURI. Chantabun, Kao Soi Dao, c. 1300 m., in evergreen forest, often on rocks, *Kerr* 9630 !

Strobilanthes latibracteatus *Imlay*, sp. nov., a *S. pectinato* T. Anders. caulibus minute pubescentibus, foliis subcoriaceis, bracteis exterioribus 2–3 cm. latis, bracteolis apice integris, filamentis basi pilosis differt.

Frutex usque 1·5 mm. altus (ex *Kerr*). *Rami* primo quadrangulares, sulcati, minute pubescentes. *Folia* inaequalia, oblongo-elliptica, apice breviter acuminata, basi attenuata, subcoriacea, lineolata, subtus costa tantum sparse pilosa, 4–14 cm. longa, 2–4 cm. lata, costa supra conspicua subtus prominente, nervis lateralibus utrinque 7–9 supra conspicuis subtus prominulis, margine obscure serrulato, petiolo 0·5–2 cm. longo suffulta. *Spicae* capitatae, breviter pedunculatae, glabrae, 3 cm. longae, 2–3 cm. latae, axem et ramos axillares terminantes ; bracteae exteriores steriles, late ovatae, apice subacutae, integrae, minute lineolatae, glabrae, 3 cm. longae, 2·5 cm. latae, interiores breviores apice serrulatae ; bracteolae 1·6 cm. longae, oblongae, obtusae, integrae, glabrae. *Calyx* 1·6 cm. longus, extus lineolatus, glaber, lobis subaequalibus oblongo-linearibus apice obtusis vel rotundatis integris intus basi sparse pilosis 1·5 mm. latis. *Corolla* candida (ex *Kerr*), 4·5 cm. longa, extus glabra ; tubus 8 mm. supra basin ampliatus ; lobi apice subaequaliter bilobati. *Stamina* 4, medio tubo affixa, 2 et 7 mm. longa, basi pilosa ; antherae oblongae, erectae, 2·5–3 mm. longae. *Ovarium* glabrum ; discus ovario aequilongus ; stylus 3 cm. longus, superne puberulus. *Capsula* ignota.

PUKET. Trang, Kao Soi Doi, c. 800 m., in open patch in evergreen forest, *Kerr* 19190 !

Strobilanthes corrugatus *Imlay*, sp. nov., a *S. lilacino* C. B. Clarke spicis brevioribus, bracteis ovatis acutis crenatis 6 mm. longis, calyce 9 mm. longo eglanduloso recedit.

Rami teretes, lignei, dense villosi, pilis pluricellularibus eglandulosis. *Folia* valde inaequalia, ovata, ad apicem acutum breviter acuminata, basi inaequaliter rotundata vel cordata, supra pilis pluricellularibus e basibus papillosis ortis scabrido-hirsuta, subtus praecipue in nervis dense molliter pilosa, majora 4–6·5 cm. longa, 2–3·5 cm. lata, petiolo 7–10 mm. longo suffulta, minora 1·5 cm. longa, petiolo 2–4 mm. longo suffulta, costa utraque pagina dense hirsuta conspicua, nervis lateralibus utrinque 8 supra depressis subtus conspicuis, nervis transversis multis supra depressis, margine undulato-crenato breviter ciliato. *Spicae* brevissimae, subcapitatae, saepe interruptae, axillares et ramos brevissimos axillares terminantes, saepe ramosae, breviter pedunculatae ; flores oppositi ; bracteae inferiores foliaceae, calyce longiores, dense hirsutae eglandulosae ; superiores ovatae, acutae, basi attenuatae, crenatae, hirsutae, 6 mm. longae, 3 mm. latae ; bracteolae calyce breviores, oblanceolatae, apice obtusae, hirsutae, 6 mm. longae. *Calyx* 9 mm. longus, extus hirsutus ; lobi oblongi, medio latiores, obtusae, intus apice medioque albo-hirsuti, posteriores 6 mm. longi, anteriores 6·5 mm. longi. *Corolla* alabastro apice dense tomentosa, demum pubescens, 3 cm. longa, tubi parte basali 10 mm. longa sensim ampliata ; lobi apice breviter bilobati. *Stamina* 4, 1·8 cm. supra basin corollae affixa, 2 et 5 mm. longa, pilosa ; antherae lineares, 2·5 mm. longae. *Ovarium* in crista apicali pubescens et glanduloso-pubescens ; stylus 2·5 cm. longus, superne puberuli. *Capsula* ignota.

Payap. Doi Chiengdao, among rocks, *Put* 372 !

Strobilanthes viscidus *Imlay*, sp. nov., a *S. lilacino* C. B. Clarke foliis majoribus haud asperis, bracteis minoribus obovatis vel spatulatis nec oblongis, corolla minore differt.

Frutex usque 1·5 m. altus (ex *Kerr*). *Rami* teretes, lignei, viscido-pubescentes. *Folia* inaequalissima, ovata, ad apicem acutum acuminata, basi inaequaliter rotundata vel cordata, lineolata, supra pilis pluricellularibus e basibus papillosis ortis breviter hirsuta, subtus costa praecipue molliter pubescentia, 3·5–8 cm. longa, 2–4·5 cm. lata, costa nervisque lateralibus utrinque 8–9 supra conspicuis subtus prominentibus, his supra parum depressis, margine crenulato pubescente ciliato, petiolo 0·7–3·5 cm. longo dense glanduloso-pubescente suffulta. *Spicae* solitariae, 2–3·5 cm. longae, dense viscido-pubescentes, terminales vel axillares, strobilatae ; pedunculi 5–10 mm. longi, dense viscido-pubescentes ; bracteae spatulatae, ovatae, obtusae, 9 mm. longae, apice 3·5 mm. latae, basi 1·25 mm. latae, virides, utraque pagina viscido-pubescentes, ciliatae. *Calyx* 9 mm. longus, extus viscido-pubescens, lobis linearibus obtusis intus appresse albo-pilosis glanduloso-ciliatis. *Corolla* purpurea (ex *Kerr*), alabastro extus apice pubescens, 3·3 cm. longa, tubi parte basali angusta 11 mm. longa. *Stamina* 4,

in medio corollae partis ampliatae affixa, 2 et 7 mm. longa, membranacea, pilosa ; antherae lineares, 2·5 mm. longae, uno loculo paulo supra alterum disposito. *Stylus* 1·6 cm. longus, glaber. *Capsula* ignota.

PAYAP. Doi Chiengdao, 1650–1770 m., abundant, plant has aromatic smell, *Kerr* 2874 ! (*type*) ; Doi Sutep, 250 m., in evergreen forest, *Kerr* ! 1650 m., *Kerr* !

Strobilanthes bombycinus *Imlay*, sp. nov., a *S. Evrardi* R. Ben. ramis glabris, foliis maturis sparse hirsutis, bracteis margine glanduloso-ciliatis, staminibus 2 et 4 mm. longis in medio corollae tubi affixis differt.

Frutex c. 1 m. altus (ex *Kerr*). *Rami* teretes, bisulcati, glabri. *Folia* maxime inaequalia, late ovata vel ovato-lanceolata, vel elliptica, ad apicem subacutum breviter acuminata, basi cuneata vel breviter attenuata, lineolata, immatura basi pubescentia utraque pagina hirsuta, matura inter nervos laterales sparse hirsuta, majora 7–12 cm. longa, 3·5–7 cm. lata, costa hirsuta supra conspicua subtus prominente, nervis lateralibus utrinque 8–9 conspicuis, margine crenato, petiolo 1–2·8 cm. longo suffulta. *Spicae* breves, densae, capitellatae, bracteatae, 1–2 cm. longae, 1·5 cm. latae, terminales saepe axillares ; pedunculus usque 2 cm. longus, apice folia parva 1–2 gerens ; bracteae plus minusve imbricatae, calyce longiores, lanceolatae, obtusae, c. 1·3 cm. longae, 4 mm. latae, basi pilis albis multicellularibus instructae, superne pubescentes, margine dense molliter glanduloso-ciliatae, persistentes ; bracteolae oblanceolato-ellipticae, acutae, 10 mm. longae, 1 mm. latae, a basi pilis longis bombycinis dense instructae, apice margineque breviter glanduloso-pubescentes. *Calyx* 10 mm. longus, indumento illi bractearum simili, lobis subaequalibus lineari-oblongis obtusis intus albo-sericeis. *Corolla* subpurpurea (ex *Kerr*), extus puberula, 3·5 cm. longa ; tubus 10 mm. a basi sensim ampliatus ; lobi 5 mm. longi. *Stamina* 4, 2 cm. a basi corollae affixa, 2 et 4 mm. longa, longiora pilosa ; antherae oblongae, 2 mm. longae. *Ovarium* apice dense pilosum ; stylus 2 cm. longus, pilosus. *Capsula* 8 mm. longa, superne dense pilosa. *Semina* dense sericea.

RACHABURI. Kanburi, Sisawat, c. 100 m., in evergreen forest, *Kerr* 10211 !

BARLERIEAE.

Barleria biloba *Imlay*, sp. nov., species distincta, a *B. courtallica* Nees bracteis ovatis vel ellipticis nec lineari-lanceolatis calyci aequalibus, sepalis anticis alte bilobatis, corollae tubo sursum attenuato nec ampliato, corollae lobo antico a medio tubo libero facile distinguitur.

Frutex suberectus, usque 30 cm. altus (ex *Kerr*). *Caules* subteretes, dense lineolati, glabri, nodis strigosis distantibus. *Folia* petiolata, subaequalia, ovata, ad apicem acutum breviter acuminata, basi subito breviter attenuata, lineolata, supra sparse

strigosa, subtus villosa, 4–10 cm. longa, 2–6·5 cm. lata, costa supra conspicua subtus prominente, nervis lateralibus utrinque 4 subtus prominulis, margine integro molliter ciliato, petiolo 1–2 cm. longo suffulta. *Spicae* densae, oblongae vel ovatae, 2–6 cm. longae, 2–3 cm. latae, caulem et ramulos terminantes, saepe axillares; bracteae late ovatae vel ellipticae, ad apicem cuspidatum recurvatum acuminatae, 2–2·3 cm. longae, 7–10 mm. latae, conspicue 3-nerves, pilis brevibus pubescentibus cum paucis longis vestitae, margine minute denticulato pilis brevibus saepe glandulosis et longis albis sericeis ciliatae; bracteolae oblongae, apiculatae, 1·5 cm. longae, 2 mm. latae, supra glabrae, subtus pubescentes, costa conspicua, margine longe ciliatae et breviter glandulosa-ciliatae. *Calycis* sepalae exteriores subaequales, oblongo-acuminatae, 5-nerves, apice breviter cuspidatae, breviter pubescentes, saepe glandulosae et pilosae, margine longe et breviter ciliatae, postica major, 2·3–2·5 cm. longa, 6–7 mm. lata, apice integro, antica 2 cm. longa, apice alte bilobata; laterales lineari-acuminatae, 1·3 cm. longae, breviter pubescentes, saepe glandulosae et pilosae, costa conspicua. *Corolla* lilacina (ex *Kerr*), 4·5 cm. longa, extus puberula; tubus 2·7 cm. longus, ad apicem attenuatus; labium anticum unipetalum, c. 1·3 cm. longum, a medio tubo liberum; posticum 4-lobatum, lobis subaequalibus oblongis vel ovatis 1·5–1·9 cm. longis. *Stamina* 2 perfecta exserta, cum staminodiis 3 minutis 7 mm. supra basin corollae affixa, basi pilosa, perfecta 4 cm. longa glabra; antherae oblongae, 6 mm. longae. *Ovarium* apice pubescens; stylus 5·2 cm. longus, basi sparse pilosus. *Capsula* 1·7 cm. longa, apice minute pubescens. *Semina* 4, compressa, pilis densis nigris sericeis vestita.

Ayuthia. Chaibadan, Dong Paya Yen, c. 100 m., in mixed forest, *Kerr* 7997! Rachaburi. Prachuap, Sam Roi Yawt, *Put* 2508! (*type*).

Lepidagathis dissimilis *Imlay*, sp. nov., a *L. falcata* Nees foliis subsessilibus coriaceis, calycis lobis anterioribus basi brevissime connatis, bracteis omnibus 5-nervibus differt.

Herba (?), c. 30 cm. alta. *Caules* obtuse quadrangulares, pilis subappressis sursum curvatis pubescentes, dense lineolati. *Folia* subsessilia, subaequalia, elliptica vel elliptico-lanceolata, apice subacuta, basi attenuata, coriacea, lineolata, supra glabra, nervis subtus pilosa, 5–8·5 cm. longa, 2–3·5 cm. lata, costa nervisque lateralibus utrinque 5–6 supra conspicuis subtus prominentibus, nervis transversis obscuris, margine subintegro recurvo, petiolo 2–3 mm. longo suffulta. *Spicae* unilaterales, axillares et terminales, solitariae vel 2–3-natae, subsessiles, densae, oblongae, 2·5–5 cm. longae, 2·5 cm. latae; bracteae steriles lanceolatae vel falcatae, acutae, sessiles, axi oblique affixae, 1·5 cm. longae, 4 mm. latae, conspicue 5-nerves, margine sparse ciliato excepto glabrae; bracteae fertiles uniflorae, oblongae, acuminatae, scariosae, cetero-quin sterilibus similes; bracteolae lineari-lanceolatae, glabrae,

virides, 1·3 cm. longae, 2 mm. latae. *Calyx* 1·3 cm. longus, margine sparse ciliato excepto glaber, scariosus; lobi 2 anteriores basi brevissime connati, 2-nerves, oblongo-acuminati, 1–2 cm. longi, 2 mm. lati; lobus posterior oblongo-acuminatus, 3–5-nervis, 1·3 cm. longus, 3·5 mm. latus. *Corolla* alba purpureo-maculata (ex *Kerr*), extus glabra, 10 mm. longa; tubus supra basin ampliatus, intus pilosus; labium inferius 3-lobatum, lobis oblongis rotundatis 1·5–2 mm. longis, superius truncatum, breviter bilobatum. *Stamina* 4, ad basin tubi corollae affixa, glabra, anteriora 4·5 mm. longa, antheris bilocularibus, posteriora 3 mm. longa, antheris unilocularibus. *Ovarium* glabrum; stylus 7 mm. longus, basi puberulus. *Capsula* 8 mm. longa, glabra. *Semina* 4, plana, pilosa.

Nakawn Sawan. Raheng, c. 100 m., among grass in deciduous jungle, *Kerr* 4576 !

Andrographieae.

Andrographis tenera (*Nees*) *Imlay*, comb. nov.

Justicia tenuiflora Wall. Cat. 7185 (1832), nomen.

Haplanthus tener Nees in Wall. Pl. As. Rar. **3,** 116 (1832).

Andrographis tenuiflora T. Anders. in Journ. Linn. Soc. **9,** 502 (1867).

Gymnostachyum Parishii and *andrographioides* T. Anders. l.c. 504 (1867).

Leptostachya (?) *oblongifolia, spathulifolia, axillaris* C. B. Clarke apud Hosseus in Engl. Bot. Jahrb. **41,** 72 (1907).

Wallich's MS. name *Justicia tenuiflora* was cited in synonymy under var. β *elongatus* of *Haplanthus tener* Nees, but was never validly published. T. Anderson adopted the epithet *tenuiflora* when he transferred *H. tener* to *Andrographis*, but excluded the var. β *elongatus*.

Graphandra *Imlay*, gen. nov., *Andrographi* Wall. affinis, sed floribus in spicis brevibus bracteatis dispositis, bracteis plus minusve imbricatis calyce majoribus, calyce 4-lobato, antheris minute mucronatis medio breviter pilosis basi haud barbatis, capsula vix compressa, seminibus compressis laevibus differt.

Herba procumbens. *Folia* opposita, integra, sessilia vel subsessilia. *Flores* in spicis bracteatis simplicibus axillaribus et terminalibus dispositi; bracteae oppositae, laxe imbricatae, calyce longiores; bracteolae 2, calyci aequilongae vel eo parum longiores. *Calycis lobi* 4, usque ad basin liberi. *Corollae* tubus limbo fere aequilongus; limbus bilabiatus, labio superiore angusto integro vel subintegro, inferiore oblongo 3-lobato lobis alabastro imbricatis. *Stamina* 2, tubo corollae ope membranae tenuis affixa, demum in fauce tubi libera; antherae loculi 2, paralleli, basi minute mucronati, medio breviter pilosi, basi haud barbati; pollinis grana subglobosa, minute punctata, obturamentis 3 in sulcis parvis jacentibus. *Ovarium* biloculare, 12-ovulatum; stylus apice minute bifidus.

Capsula oblonga, vix compressa, haud stipitata, 12-sperma. *Semina* basalia, compressa, laevia, subglabra.

Graphandra procumbens *Imlay*, sp. nov., adhuc unica.

Herba ramosa, procumbens. *Caules* tenues, virides, glabri. *Folia* sessilia vel subsessilia, aequalia, ovato-oblonga, apice acuta vel subacuta, basi acuta, subcoriacea, utraque pagina subglabra, 0·6–2·2 cm. longa, 4–8 mm. lata, costa nervisque lateralibus utrinque 3 subtus subobscuris, margine integro incrassato glabro, petiolo 0–2 mm. longo suffulta. *Spicae* simplices, bracteatae, ramos laterales erectos terminantes; flores solitarii, alterni; bracteae plus minusve imbricatae, oppositae, cujusque paris altera sterili, oblongae vel oblanceolatae, apice acutae, glabrae, obscure nervosae, 9–10 mm. longae, 3–4 mm. latae; bracteolae oblongo-lanceolatae, apice brevissime acuminatae, glabrae, 8 mm. longae, 1 mm. latae, calyce parum longiores. *Calycis lobi* 4, anguste lanceolati, acuminati, 7 mm. longi, minute puberuli et ciliati, pilis multis glandulosis obtecti. *Corolla* albo-rosea (ex *Kerr*), extus puberula, 1·3 cm. longa; tubus rectus, angustus, intus basi puberulus, 6 mm. longus; labium superius anguste lanceolatum, apice obtusum subintegrum, basi parum concavum, 6 mm. longum, 2 mm. latum, inferius oblongum, 7·5 mm. longum, 4 mm. latum, trilobum, lobis 2 mm. longis obtusis medio latiore. *Stamina* 2, tubo corollae per 5 mm. adnata, demum libera, 1 mm. longa, glabra; antherae loculi 2, basi brevissime mucronati, 2 mm. longi, medio dense pubescentes. *Ovarium* sparse pubescens; stylus 8 mm. longus, sparse pubescens. *Capsula* 8 mm. longa, oblonga, vix compressa, apice puberula excepta glabra, 12-sperma. *Semina* ovoidea, compressa, laevia, pilis paucis ornata.

Udawn. Nakawn Panom, Ta Utên, c. 200 m., in open grassy ground, *Kerr* 8454 !

This genus clearly belongs to the subtribe *Andrographieae* on account of the twelve-seeded capsule, the hooked ejaculators, the two stamens, the corolla lobes imbricate in the bud, and the similar pollen grains. It is most closely related to *Andrographis*, but has several striking points of difference. The plant is small and procumbent, and the small bracteate spikes are borne on erect branchlets. This habit and the bracts larger than the calyx are as yet unknown in *Andrographis*. Also the calyx is persistently 4-lobed, the stamens are attached to the corolla tube for a short distance by a thin membrane, and the anther loculi are definitely not bearded at the base but have a dense pubescent patch at the middle. In *Andrographis* the capsule is flattened, and the seeds are subglobose and pitted, while in *Graphandra* the capsule is scarcely flattened, if at all, and the seeds are compressed with a smooth surface.

Gymnostachyum decurrens *Stapf* var. **Robinsonii** (*Ridley*) *Imlay*, stat. nov.

G. Robinsonii Ridley in Journ. Roy. As. Soc. Str. Br. **86**, 305 (1922); Fl. Mal. Pen. **2**, 579 (1923).

var. **glabrum** *Imlay*, var. nov., a typo spicis calyce capsulaque omnino glabris differt.

SURAT. Surat, Kantuli, *Put* 4116 ! (*type*), *Put* 4156 !

Gymnostachyum signatum (*R. Ben.*) *Imlay*, comb. nov.

Cryptophragmium signatum R. Ben. in Bull. Soc. Bot. France, **81,** 602 (1934), et in Lec. Fl. Gén. Indo-Ch. **4,** 700 (1935).

Gymnostachyum coriaceum *Imlay*, sp. nov., a *G. affini* Nees foliis minoribus coriaceis, spicis secundis floribus haud oppositis, corollae lobis rotundatis, antheris basi acutis nec mucronatis differt.

Caules erecti, 10–20 cm. longi, saepe basi ramosi, dense pubescentes. *Folia* ovata, apice obtusa, basi rotundata vel breviter cuneata, coriacea, supra glabrata, subtus pubescentia, 2·5–5 cm. longa, 1·5–3 cm. lata, costa nervisque lateralibus utrinque 4–5 conspicuis, margine paulum recurvato, petiolo 5 mm. longo tomentoso suffulta. *Spicae* terminales et axillares, 2–3-natae, densae, secundae, fere glabrae, 4–8 cm. longae, breviter pedunculatae ; flores solitarii ; bracteae lanceolatae, acutae, virides, 3-costatae, corneae, calyce breviores, 5 mm. longae, 1 mm. latae, glabrae, ciliatae, extus punctatae ; bracteolae lanceolatae, acuminatae, 4 mm. longae. *Calyx* 6 mm. longus, extus glaber, punctatus ; lobi basi 1·5 mm. connati, lineari-acuminati, 3-costati, ciliolati. *Corolla* extus glabra, 7–8 mm. longa ; tubus tam longus quam limbus, fauce pubescens ; labium superius subintegrum vel minute bilobatum ; inferius 3-lobatum, lobis brevibus rotundatis. *Stamina* ad apicem corollae tubi affixa, 1 mm. longa, glabra ; antherae oblongae, 2 mm. longae, subaequales, basi acutae. *Ovarium* glabrum ; stylus 4 mm. longus, pilosus. *Capsula* 1 cm. longa, glabra, a basi 9–10-sperma.

UDAWN. Sakon, Wa Nawn, c. 200 m., in bamboo jungle, *Kerr* 8498 !

Phlogacanthus paniculatus (*T. Anders.*) *Imlay*, comb. nov.

Cystacanthus paniculatus T. Anders. in Journ. Linn. Soc. **9,** 458 (1867) ; C. B. Clarke in Hook. f. Fl. Brit. Ind. **4,** 514 (1884).

var. **dejectus** *Imlay*, var. nov., a typo inflorescentia saepe axillari minute pubescente pilis aliquando glandulosis, calyce 9–12 mm. longo lobis post capsulam maturatam deflexis differt.

NAKAWN SAWAN. Kampêngpêt, c. 100 m., in open deciduous forest, *Kerr* 5960 !

The deflexed sepals give this plant a dejected appearance, which suggested the varietal epithet.

var. **abbreviatus** (*Craib*) *Imlay*, stat. nov.

Cystacanthus abbreviatus Craib in Kew Bull. 438 (1911).

Phlogacanthus abbreviatus (Craib) R. Ben. in Lec. Fl. Gén. Indo-Ch. **4,** 712 (1935).

Phlogacanthus pedunculatus *Imlay*, sp. nov., a *P. paniculato* (T. Anders.) Imlay paniculis laxioribus longius pedunculatis, calyce longiore differt.

Frutex c. 4·5 m. altus (ex *Kerr*). *Rami* quadrangulares, glabri, cortice tenui pallido obtecti. *Folia* subaequalia, late lanceolata vel ovato-lanceolata, ad apicem subacutum attenuata, basi cuneata vel breviter attenuata, chartacea, dense lineolata, supra glabra, subtus minute pubescentia, 8–19 cm. longa, 4–8 cm. lata, costa cum nervis lateralibus utrinque 8 supra conspicuis subtus prominulis, nervis transversis subtus conspicuis, margine integro, petiolo 1–4·5 cm. longo minute pubescente suffulta. *Panicula* angusta, laxa, terminalis, ramis remotis simplicibus vel cymosis 1–2·5 cm. longis, glanduloso-pubescens ; bracteae infimae foliaceae, petiolatae, 2 cm. longae, superiores minimae ; bracteolae parvae, 0·5 mm. longae, glanduloso-pubescentes. *Calyx* sub anthesi 1·2 cm. longus, sub fructu 1·7 cm. longus, dense glanduloso-pubescens, lobis oblongis acuminatis 2 mm. latis posteriore paulo longiore. *Corolla* lilacina (ex *Kerr*), extus glanduloso-pubescens, c. 2 cm. longa, tubo 5 mm. a basi curvato et ventricoso, lobis subaequalibus rotundatis. *Stamina* 2 fertilia, staminodiis nullis, 1·2 mm. longa, antheris 4 mm. longis. *Ovarium* dense pilosum, apice glandulosum ; stylus 1·4 cm. longus, pilosus. *Capsula* 2·8 cm. longa, oblongo-linearis, attenuata, tetragona, a basi 2-sperma. *Semina* minute verrucosa et pilosa.

Payap. Me Ping Rapids, Kêng Soi, 180 m., in evergreen by river, *Kerr* 2939 ! (*type*) ; Lampun, Mê Li, 480 m., near stream, *Winit* 248 ! Maharat. Lampang Province, Chê Hom, c. 350 m., in mixed jungle, *Kerr* 4797 ! Rachaburi. Kanburi, Sisawat, c. 100 m., in evergreen forest, *Kerr* 10200 !

Phlogacanthus pauciflorus *Imlay*, sp. nov., a *P. paniculato* (T. Anders.) Imlay racemis simplicibus 3 cm. longis, calyce 10 mm. longo, foliis utraque pagina puberulis ciliolatis differt.

Suffrutex c. 1 m. altus (ex *Winit*). *Caules* e radice perenni orti, annui, recti, quadrangulares, puberuli, cortice stramineo obtecti. *Folia* oblanceolata, oblongo-lanceolata vel late lanceolata, apice breviter vel vix obtuse acuminata, basi cuneata, chartacea, pagina utraque puberula, supra fusca, subtus pallidiora, 4·5–7 cm. longa, 1·5–2·6 cm. lata, costa nervisque lateralibus utrinque 6 supra conspicuis subtus prominulis, nervis transversis paucis, margine ciliolato, petiola usque 1·5 mm. longo suffulta. *Racemi* terminales, usque 3 cm. longi ; bracteae lineari-lanceolati, 5 mm. longae, pubescentes ; bracteolae minimae. *Calyx* 10 mm. longus, dense glanduloso-pubescens, lobis lineari-lanceolatis 1 mm. latis. *Corolla* purpurea (ex *Kerr*), extus glanduloso-pubescens, 2·5 cm. longa, tubo 6 mm. a basi curvato et ventricoso, lobis subaequalibus rotundatis. *Stamina* 2 fertilia, staminodiis nullis, 6 mm. a basi corollae affixa, basi tantum pilosa, antheris 4 mm. longis. *Ovarium* sparse puberulum ; stylus 1·5 cm. longus, subglaber. *Capsula* 2·8 cm. longa, a basi 12-sperma.

Maharat. Lampang, Palat near Lakon, 360 m., in deciduous bamboo jungle, *Kerr* 2330 ! (*type*) ; Lampang, Mê Saloi, c. 200 m.,

in moist mixed evergreen forest, *Winit* 1899 ! Mê Luang, 350 m., in teak jungle, coming up after jungle fires are over, *Winit* 834 ! (from which description of capsule taken).

Phlogacanthus rectiflorus *Imlay*, sp. nov., a *P. vitellino* (Roxb.) T. Anders. foliis oblanceolatis vel obovatis, corolla 2·5 cm. longa tubo recto superne sensim ampliato, capsula 2·4 cm. longa differt.

Suffrutex usque 0·3 m. altus (ex *Kerr*). *Rami* primo quadrangulares, minute pubescentes, cortice tenui obtecti. *Folia* oblanceolata vel ovata, ad apicem acutum breviter acuminata, basi attenuata, supra glabra, nigro-punctata, nervis subtus puberula, 7–12 cm. longa, 2·5–5·8 cm. lata, costa et nervis lateralibus utrinque 6–7 supra conspicuis subtus prominentibus, his superne arcuatis, margine subintegro vel obscure crenulato breviter recurvato, petiolo 1–2·5 cm. longo subglabro suffulta. *Inflorescentia* terminalis, c. 3 cm. longa, pubescens, spiciformis, floribus superioribus solitariis pedicellatis, inferioribus in cymis paucifloris pedunculatis dispositis ; bracteae lineari-oblanceolatae, acutae, dense pubescentes, 4–5 mm. longae ; bracteolae ad medium pedicellum affixae, bracteis similes. *Calyx* 4 mm. longus, dense minute pubescens, lobis acutis minute ciliolatis. *Corolla* alba, coccineo-maculata (ex *Kerr*), extus pubescens, 2·5 cm. longa, tubo recto superne sensim ampliato ; lobi subbilabiati, oblongi vel ovati, apice apiculati, 8 mm. longi, lobis posticis basi connatis. *Stamina* 2 fertilia cum 2 staminodiis 6·5 mm. a basi corollae affixa, 1·3 cm. longa, fere glabra ; antherae oblongae, 4 mm. longae, dorso glandulosae. *Ovarium* glabrum ; stylus glaber. *Capsula* oblonga, sulcata, 2·4 cm. longa. *Semina* 8, plana, nigra, margine brunnea, minute puberula.

Puket. Pang-nga, Bangto, c. 100 m., in evergreen scrub, *Kerr* 17233 !

This may prove to be only a variety of *P. vitellinus* in spite of the difference in the size and shape of the corolla.

Phlogacanthus prostratus *Imlay*, sp. nov., ab omnibus speciebus generis habitu prostrato, racemis paucifloris brevissimis, foliis usque 6 cm. longis subcoriaceis margine recurvo recedit.

Suffrutex prostratus (ex *Kerr*). *Caules* quadrangulares, glabri, cortice tenui obtecti. *Folia* inaequalia, brevissime petiolata, elliptico-lanceolata, apice basique subacuta, subcoriacea, supra glabra aspera, nervis subtus pubescentia, 2·5–6 cm. longa, 1–2 cm. lata, costa nervisque lateralibus utrinque 5–6 supra paulum conspicuis subtus prominentibus, margine integro recurvato glabro, petiolo 0–5 mm. longo suffulta. *Flores* pauci, pedicellati, in racemo brevi terminali dispositi ; bracteae 5 mm. longae, oblongae, obtusae, glanduloso-pubescentes ; bracteolae minores. *Calyx* 11 mm. longus, dense glanduloso-pubescens, lobis linearibus obtusis. *Corolla* purpurea (ex *Kerr*), extus pubescens, c. 2·5 cm.

longa ; tubus 5 mm. a basi curvatus et ventricosus ; lobi subaequales, rotundati. *Stamina* 2 fertilia, staminodiis nullis, basi corollae partis ventricosae inter pilos affixa. *Ovarium* fere glabrum. *Capsula* ignota.

PAYAP. Ban Mê Ta (between Lakon and Lampun), c. 450 m., in *eng* jungle, *Kerr* 2306 !

ASYSTASIEAE.

Asystasia salicifolia *Craib*, var. **glabra** *Imlay*, var. nov., a typo foliis lanceolatis longe acuminatis basi latioribus, calyce 10 mm. longo glabro lobis c. 2·5 mm. latis differt.

PAYAP. Doi Pa Kao, west slope, 1500 m., *Garrett* 705 !

var. **parviflora** *Imlay*, var. nov., a typo floribus minoribus 2 cm. longis, calyce minore, racemo densiore differt.

SURAT. Chumpawn, Ta Ngaw, c. 50 m., in evergreen forest, *Kerr* 11471 !

Asystasia hispida *Imlay*, sp. nov., ab *A. salicifolia* Craib foliis utraque pagina hispidulis exsiccatis flavo-viridibus, racemis ramosis nec simplicibus, calyce dense glanduloso-pubescente recedit.

Herba erecta, c. 50 cm. alta. *Caules* ramosi, quadrangulares, quadrisulcati, pilis patentibus breviter hispido-pubescentes, primo densius. *Folia* sessilia vel subsessilia, oblongo-lanceolata vel oblonga, raro lanceolata, ad apicem acutum vel subacutum acuminata, basi obtusa vel rotundata, utraque pagina dense breviter hispida, supra lineolata, 6–16 cm. longa, 2·5 cm. lata, costa supra conspicua subtus prominente, nervis lateralibus utrinque 8–11 prominulis, nervis transversis obscuris, margine integro subrecurvato. *Racemi* terminales, ramosi, secundi, 3–9 cm. longi, axi pubescente, internodiis subturgidis, pedunculo 3–4 cm. longo pubescente suffulti ; pedicelli 1–3 mm. longi, puberuli ; bracteae oppositae, altera sterili, deltoideae, acutae, costatae, 2–3 mm. longae, 1·5 mm. latae, glabrescentes ; bracteolae similes sed minores, basi pedicelli affixae. *Calyx* 7–8 mm. longus, dense glanduloso-pubescens, apice ciliolatus, lobis oblongo-linearibus acutis 1–2 mm. latis. *Corolla* subrosea (ex *Kerr*), extus brevissime glanduloso-pubescens, c. 3 cm. longa, tubi parte basali 1 cm. longa intus puberula, lobis rotundatis 7 mm. longis 6–9 mm. latis. *Stamina* 4, filamentis glabris, 9 et 11 mm. longis, loculis 2·5 mm. longis basi minute apiculatis. *Ovarium* dense glanduloso-pubescens ; stylus 2 cm. longus, basi pubescens. *Capsula* c. 2·7 cm. longa, dense glanduloso-pubescens. *Semina* 4, compressa, ovata, basi rostrata, glabra, rugosa, margine plano crasso.

PAYAP. Doi Sutep, *Kerr* 3074 ! (*type*) ; Doi Chiengdao, *Put* 4434 !

Asystasia bracteata *Imlay*, sp. nov., ab *A. Kerrii* Craib racemi floribus infimis cymulosis, bracteis 2·5 cm. longis calycis longitudine, corollae parte angusta intus pilosa, ovario glabro, foliorum nervis lateralibus utrinque 11 recedit.

Frutex usque 3 m. altus (ex *Kerr*). *Caules* subteretes, plani, glabri, lineolati. *Folia* petiolata, opposita, subaequalia, elliptica, ad apicem acutum vel obtusum acuminata, basi breviter attenuata vel cuneata, chartacea, glabra, supra lineolata, 8–10·5 cm. longa, 2·5–7 cm. lata, costa supra conspicua subtus prominente, nervis lateralibus utrinque 10–13 supra conspicuis subtus prominulis, apice curvatis saepe intra marginem anastomosantibus, margine integro subrecurvo, petiolo 1–3 cm. longo suffulta. *Racemi* terminales, 5–12 cm. longi, solitarii, raro gemini ; flores oppositi, solitarii, basi racemi cymulosi ; pedicelli 2–4 mm. longi, glanduloso-pubescentes ; bracteae lanceolatae, acuminatae, basi attenuatae, 2·5 cm. longae, 5–7 mm. latae, costa nervisque conspicuis, glanduloso-pubescentes et ciliatae ; bracteolae lineari-lanceolatae, acuminatae, 1·5 cm. longae, 1–1·5 mm. latae, ad basin pedicelli affixae, ceteroquin bracteis similes. *Calycis* lobi glanduloso-pubescentes et ciliati, 2–2·7 cm. longi, 1–2 mm. lati, lineari-lanceolati, acuminati, posticus ceteris longior et latior, intus pubescentes, costati. *Corolla* subrosea, rubro-maculata (ex *Kerr*), extus pubescens, cum pilis paucis glandulosis, 3 cm. longa ; tubi pars angusta basalis 1 cm. longa, intus pilosa, pars expansa 1·4 cm. longa, intus glabra ; lobi subbilabiati, duo postici usque ad medium connati, oblongi, obtusi. *Stamina* 4, filamentis 8–10 mm. longis, glabris ; antherae loculi oblongi, 2 mm. longi, basi calcarati, dorso breviter setulosi. *Ovarium* glabrum ; stylus 2 cm. longus, basi pilis paucis ornatus. *Capsula* 2 cm. longa, clavata, glabra. *Semina* 4, suborbicularia, compressa, breviter pilosa.

CHANTABURI. Krat, Kao Kuap, c. 400 m., in evergreen forest, *Kerr* 17707 !

Pseuderanthemum axillare *Imlay*, sp. nov., ab omnibus speciebus generis foliis angustissimis, floribus axillaribus subsessilibus, lobis corollae apice crenulatis recedit.

Herba (?), usque 0·5 m. alta, basi ramosa. *Ramuli* pauci, erecti, tenues, quadrangulares, faciebus oppositis pilis recurvis instructis. *Folia* sessilia vel subsessilia, lineari-lanceolata vel lineari-elliptica, apice obtusa, basi cuneata, dense lineolata, supra glabra, subcoriacea, subtus costa sparse pilosa punctata, 1·5–5 cm. longa, 3–9 mm. lata, costa prominente, nervis lateralibus utrinque 5–6 obscuris, petiolo 0–2 mm. longo suffulta. *Flores* subsessiles, solitarii usque terni, axillares ; bracteae oblongo-ellipticae, obtusae, usque 3 cm. longae, 2·5 mm. latae, foliaceae, lineolatae, subtus sparse pilosae, costa prominente ; bracteolae lineari-acuminatae, 3 mm. longae, 0·5 mm. latae. *Calyx* 6 mm. longus, extus glanduloso-pubescens, lobis subacutis obscure 3-nervibus intus subglabris. *Corolla* alba (ex *Kerr*), 3 cm. longa, extus glabra ; tubus angustus, apice 3 mm. ampliatus ; lobi subaequales, elliptici, obtusi, 10 mm. longi, 4–5 mm. lati, apice crenulati et sparse setulosi. *Stamina* 2 fertilia, cum staminodiis 2 minutis in corollae parte ampliata affixa, 1 mm. longa, glabra ; antherae oblongae, 1·5 mm. longae, in tubo

corollae inclusae. *Ovarium* puberulum; stylus 1·4 cm. longus, glaber. *Capsula* ignota.

RACHASIMA. Korat, Sikiu, c. 200 m., in bamboo scrub, *Kerr* 19909 ! (*type*). Pak Tong Chai, c. 200 m., in scrub jungle, *Kerr* 8095 !

Pseuderanthemum bracteatum *Imlay*, sp. nov., ab omnibus speciebus generis bracteis foliosis dentatis calyce longioribus facile distinguendum.

Herba (?), c. 0·5 m. alta. *Caules* tenues, erecti, superne pubescentes. *Folia* ovata vel ovato-lanceolata, ad apicem acutum breviter acuminata, basi cuneata vel breviter attenuata, chartacea, lineolata, primo utraque pagina glanduloso-pubescentia, demum subglabra, 5–10 cm. longa, 2–4 cm. lata, suprema minora bracteiformia, costa nervisque lateralibus utrinque 6–7 supra conspicuis subtus prominulis, his intra marginem conjunctis, nervis transversis obscuris, margine subintegro vel obscure denticulato primo glanduloso-ciliata, petiolo 0·5–1·5 cm. longo pubescente suffulta. *Spicae* terminales et axillares, simplices, 3–7 cm. longae, pubescentes, floribus 1–3-natis; bracteae ovatae et obovatae, acuminatae vel mucronatae, nervosae, petiolatae, dentatae, pubescentes vel glanduloso-pubescentes, infimae foliaceae, 0·5–1·5 cm. longae, 0·4–1 cm. latae, petiolo 3–6 mm. longo; bracteolae lineari-acuminatae, 4–5 mm. longae, dense pubescentes. *Calyx* 6–7 mm. longus, extus glanduloso-pubescens, lobis aequalibus lineari-acuminatis obscure nervosis. *Corolla* rosea, lobis maculatis (ex *Kerr*), extus piloso-pubescens, 4–4·5 cm. longa, tubo apice parum ampliato; lobi subaequales, oblongo-ovati, obtusi, 9–10 mm. longi. *Stamina* 2 fertilia, cum staminodiis 2 minutis in parte corollae ampliata affixa, 2 mm. longa, glabra; antherae oblongae, 2 mm. longae, in tubo corollae subinclusae. *Ovarium* apice puberulum; stylus 2·7 cm. longus, pilosus. *Capsula* 1·7 cm. longa, pubescens. *Semina* 4, una pagina foveolata, altera granulata.

NAKAWN SAWAN. Takli, *Put* 2113 ! (*type*). RACHASIMA. Chaiyapum, Chawng Sam Maw, c. 200 m., in deciduous forest, *Kerr* 19976 !

Pseuderanthemum glomeratum *Imlay*, sp. nov., ab affini *P. Parishii* (T. Anders.) Lindau floribus semper fasciculatis remotis nunquam solitariis, pedunculo longiore, foliorum nervis lateralibus utrinque 7–9, corollae lobis brevioribus, staminodiis 2 et 5 mm. longis recedit.

Caules subteretes, erecti, primo pubescentes. *Folia* elliptica vel lanceolata, ad apicem obtusum breviter acuminata, basi cuneata vel attenuata, purpureo-variegata, lineolata, supra glabra, nervis subtus pubescentia, 10–16 cm. longa, 4–6·5 cm. lata, costa supra conspicua subtus prominente, nervis lateralibus utrinque 7–9 conspicuis intra marginem subintegrum conjunctis, petiolo 1·5–3 cm. longo pubescente suffulta. *Inflorescentia* terminalis, spiciformis,

simplex vel ramosa, longe pedunculata, glanduloso-pubescens; flores in fasciculis remotis oppositis cymosis dispositi, nunquam solitarii; bracteae 3 mm. longae, lineari-acuminatae, glanduloso-pubescentes; bracteolae 2·5 mm. longae; pedicelli usque 3 mm. longi, glanduloso-pubescentes. *Calyx* 6 mm. longus, extus glanduloso-pubescens et glanduloso-ciliatus, lobis subaequalibus linearibus subacutis intus puberulis. *Corolla* lilacina (ex *Kerr*), extus glabra, c. 5 cm. longa; tubus angustus, 3·9 cm. longus, apice infundibuliformus, intus glaber; lobi subaequales, elliptici, subacuti, 8–10 mm. longi. *Stamina* 2 anteriora fertilia, cum staminodiis 2 antheris imperfectis basi partis corollae tubi ampliatae affixa, filamentis 9–11 mm. longis glabris; antherae loculi subexserti, elliptici, 3 mm. longi, altero paulum altius affixo. *Ovarium* glabrum; stylus 4 cm. longus, glaber. *Capsula* 2·5 cm. longa, glanduloso-pubescens. *Semina* 4, in parte superiore capsulae affixa.

MAHARAT. Nan, Doi Wao, 900 m. in evergreen jungle, *Kerr* 2438!

Pseuderanthemum siamense *Imlay*, sp. nov., ab affini *P. Parishii* (T. Anders.) Lindau inflorescentia subsessili haud ramosa, corolla extus pubescente lobis obtusis, filamentis 5 mm. longis, staminodiis puberulis recedit.

Suffrutex. *Caules* teretes, erecti, superne pubescentes. *Folia* oblongo-elliptica, lanceolata vel late lanceolata, ad apicem breviter acuminata, basi cuneata, nervis purpureo-variegata, lineolata, supra sparse setulosa vel subglabra, nervis subtus pubescentia, 11·5–13·5 cm. longa, 3·5–5·5 cm. lata, costa supra conspicua subtus prominente, nervis lateralibus utrinque 6–7 conspicuis; margine integro subrecurvato, petiolo 1·3–2 cm. longo pubescente suffulta. *Inflorescentia* terminalis, spiciformis, haud ramosa, pubescens, 5–10 cm. longa, sessilis vel subsessilis; flores solitarii, raro 2-nati; pedicelli usque 2 mm. longi; bracteae 2·5–3 mm. longae, lineari-acuminatae, puberulae, ciliolatae; bracteolae cum bracteis basi pedicelli affixae, 2 mm. longae. *Calyx* 7 mm. longus, extus breviter glanduloso-pubescens et glanduloso-ciliatus, lobis aequalibus linearibus acutis 3-nervibus. *Corolla* roseo-lilacina (ex *Garrett*), extus pubescens, 4·5 cm. longa, tubo apice ampliato, lobis subaequalibus ellipticis obtusis 1·1–1·3 cm. longis. *Stamina* 2 anteriora fertilia, cum staminodiis 2 clavato-capitatis in parte corollae tubi ampliata affixa, filamentis fertilibus 5 mm. longis basi puberulis; antherae subexsertae, lineares, acutae, 2·5 mm. longae. *Ovarium* glabrum; stylus 3·4 cm. longus, glaber. *Capsula* 2 cm. longa, minute glanduloso-pubescens, in parte superiore 4-sperma.

PAYAP. Chiengmai, Doi Sutep, c. 1050 m., in evergreen jungle, *Kerr* 2543! 1779! MAHARAT. Nan, Doi Pa Ngua, c. 1130 m., *Garrett* 141! (*type*).

Pseuderanthemum longistylum *Imlay*, sp. nov., a *P. palatifero* (Wall.) Radlk. foliis ovatis vel ovato-lanceolatis glabris nervis

lateralibus utrinque 5, inflorescentia raro basi ramosa, corollae tubo apice parum ampliato, ovario capsulaque puberulis differt.

Frutex. *Rami* teretes, subglabri, cortice stramineo obtecti. *Folia* aequalia, ovata vel ovato-lanceolata, ad apicem subacutum brevissime acuminata, basi cuneata vel breviter attenuata, lineolata, glabra, 3·5–11 cm. longa, 2–6 cm. lata, costa supra conspicua subtus prominente, nervis lateralibus utrinque 5 supra conspicuis subtus prominulis, nervis transversis obscuris, margine subintegro parum recurvato, petiolo 0·5–2 cm. longo suffulta. *Inflorescentia* terminalis et in axillis superioribus, solitaria vel gemina, simplex vel raro basi ramosa, ramis haud patentibus, c. 22 cm. longa, minute pubescens vel glanduloso-pubescens; flores oppositi, aliquando subalterni, solitarii vel 2–3-nati, breviter pedicellati; bracteae cum bracteolis minutae, lanceolatae, puberulae, pedicello vix longiores. *Calyx* 5 mm. longus, minute pubescens et glanduloso-pubescens, lobis lineari-acuminatis. *Corolla* rosea, basi lobi anterioris rubro-maculata (ex *Kerr*), extus puberula, 3·5–4 cm. longa, tubo recto apice parum ampliato; lobi oblongi vel ovati, obtusi, 2 posteriores usque ad tertiam partem connati. *Stamina* 2 fertilia, cum staminodiis 2 minutis in fauce corollae affixa, 1 mm. longa; antherae oblongae, 1·5 mm. longae, subexsertae. *Ovarium* superne puberulum; stylus 2·6 cm. longus, sparse pilosus. *Capsula* 1·8 cm. longa, puberula.

Rachasima. Chaiyapum, Pu Kio, c. 1000 m., in evergreen forest, *Kerr* 20247 ! Chantaburi. Chantabun, Kao Sabap, c. 100 m., on rocky ground in evergreen forest, *Kerr* 18090 ! Krat, Baw Rai, c. 200 m., in evergreen forest, *Kerr* 9460 ! Krungtep. Bangkok, plant brought from Kan Kradai, Prachuap, and cultivated in Bangkok, *Kerr* 19866 ! (*type*); Bangkok, in scrub jungle, *Kerr* 6752 ! Temple, Bangkok, *Marcan* 494 ! Tidal, on old brick work, *Kerr* 3995 ! Rachaburi. Kanburi, Sisawat, c. 100 m., in mixed deciduous forest, *Kerr* 10202 ! Kanburi, Takanun, c. 100 m., growing among limestone rocks, *Kerr* 10503 ! Pran, *Put* 2455 ! Prachuap, Hui Yang, *Put* 3192 ! Bangtapan, *Put* 1416 ! 1400 ! Surat. Ban Krut, c. 50 m., in evergreen forest, *Kerr* 18163 ! Kaw Tao, near sea level, in evergreen forest, *Kerr* 11149 ! c. 100 m., in evergreen forest, *Kerr* 12708 ! Puket. Ranawng, Kaw Chang, c. 5 m., very common in evergreen forest, *Kerr* 16609 ! Lam Lieng, c. 10 m., in scrub, *Kerr* 16418 !

Pseuderanthemum crenulatum (*Wall. ex Lindl.*) *Radlk.* var. **ecorticatum** *Imlay*, var. nov., a typo ramis ecorticatis, foliis usque 22 cm. longis nervis lateralibus utrinque 8–10, inflorescentia longe pedunculata axi crasso costato, calyce glanduloso-pubescente, corolla extus glabra, ovario puberulo differt.

Surat. Chumpawn, Ta Ngaw, c. 100 m. by stream in evergreen forest, *Kerr* 11491 ! (*type*); Tasan, c. 20 m., in open evergreen forest, *Kerr* 16271 ! Puket. Pang-nga, Tap-put, c. 100 m., by stream in evergreen forest, *Kerr* 19355 !

var. **glabrum** *Imlay*, var. nov., a typo foliis omnino glabris, corolla capsulaque glabra differt.

Puket. Pang-nga, Nop Pring, c. 100 m., on limestone rocks, *Kerr* 19367 ! (*type*). Nakawn Sritamarat. Tung Song, *Put* 2366 !

Justicieae.

Marcania *Imlay*, gen. nov., *Graptophyllo* Nees affinis, sed corolla ⅔ longitudinis alte bilabiata, staminibus haud exsertis prope basin corollae tubi in tomento insertis, antheris dense tomentosis, staminodiis nullis differt.

Frutex. *Folia* opposita, integra, ovata, petiolata. *Flores* terminales et in axillis superioribus, in fasciculis parvis vel cymis paucifloris dispositi ; bracteae et 2 bracteolae parvae. *Calycis* lobi 5, aequales vel subaequales, fere usque ad basin liberi. *Corollae* tubus brevis, supra basin ventricosus ; limbus alte bilabiatus, labio superiore oblongo apice breviter bilobo, inferiore recurvato apice latiore alte 3-lobato, lobis oblongis haud linearibus in alabastro imbricatis. *Stamina* 2, prope basin corollae in tomento inserta, staminodiis nullis ; antherarum loculi 2, oblongi, paralleli, dense tomentosi ; pollinis grana ellipsoidea, fasciis punctatis latis 3 et angustis 6 in polis convergentibus ornata, obturamentis 3 in sulcis inter fascias angustas jacentibus. *Ovarium* biloculare, 4-ovulatum ; discus annularis, grandis ; stylus apice minute bifidus. *Capsula* ignota.

Marcania grandiflora *Imlay*, sp. nov., adhuc unica.

Frutex c. 1–2 m. altus (ex *Marcan*). *Rami* teretes, glabri, cortice griseo rugoso tecti. *Folia* ovato-acuminata, apice acuta, basi rotundata aliquando inaequaliter, lineolata, glabra, exsiccata, supra brunnea subtus viridia, 6–12·5 cm. longa, 3–6·5 cm. lata, costa supra conspicua subtus prominente, nervis lateralibus utrinque 7 supra vix conspicuis subtus subprominentibus apice anastomosantibus, margine integro, petiolo 1–3·5 cm. longo glabro suffulta. *Flores* terminales et in axillis superioribus, in cymis paucifloris dispositi ; pedicelli 3–5 mm. longi, dense breviter villosi, pilis multicellularibus ; bracteae basi pedicelli affixae, lineari-lanceolatae, acuminatae, 5 mm. longae, 1 mm. latae, dense villoso-pubescentes ; bracteolae medio pedicelli affixae, bracteis similes, 4 mm. longae. *Calyx* 1·5–1·7 cm. longus, extus dense breviter villoso-pubescens, lobis subaequalibus lineari-lanceolatis 2–3 mm. latis 3-costatis intus breviter pubescentibus. *Corolla* alba (ex *Marcan*), 4·5–5 cm. longa, extus pubescens, tubo c. 1·5 cm. longo intus tomentoso ; labium superius oblongum, apice breviter bilobum, lobis 6 mm. longis rotundatis ; inferius recurvatum, apice latius, lobis oblongis rotundatis 10 mm. longis 7 et 11 mm. latis medio latiore. *Stamina* basi corollae in tomento inserta, 2 cm. longa, glabra, staminodiis nullis ; antherae inclusae, basi acutae, dense tomentosae, 4·5 mm. longae. *Ovarium* dense albo-pilosum ; stylus 3·6 cm. longus, pilosus.

RACHABURI. Petchaburi, hill, 70 m., *Marcan* 539 ! (*type*) ; under 50 m., in crevices of precipitous limestone cliff, *Kerr* 10999 !

The two parallel and equal anther cells, the similar pollen grains, the bilabiate corolla and the 4-ovulate ovary relate this genus very closely to *Graptophyllum* in the tribe *Justicieae*. But it can be readily distinguished by the complete absence of staminodes, of which there are always two in *Graptophyllum*, and by the stamens, which are included, and inserted near the base of the corolla tube in a tomentose ring. The anther cells, too, are distinctive in being densely tomentose. The corolla differs in being bilabiate for more than two-thirds of its length, and in the lobes of the lower lip being not linear and obtuse but oblong and rounded.

The genus can also be related to *Cyclacanthus* S. Moore, with which it agrees in the complete absence of staminodes and in the number of ovules, but differs strikingly in the shape of the corolla and in the level of staminal insertion.

The genus is named in honour of the collector, Mr. A. Marcan.

Thysanostigma *Imlay*, gen. nov., *Filetiae* Miq. affinis, sed staminibus duobus posticis antheras uniloculares ferentibus, stigmate aequaliter bilobato ciliolato differt.

Herba. *Folia* opposita, integra. *Spicae* axillares, simplices, pedunculatae ; flores alterni ; bracteae subopppositae, lanceolatae, calyce paulo longiores ; bracteolae 2, lineares, parvae. *Calycis lobi* 5, subaequales, usque ad basin liberi. *Corolla* tubulosa, limbo bilabiato ; labium superius erectum, apice emarginatum, inferius oblongum, brevissime 3-lobatum, lobis alabastro imbricatis. *Stamina* 4, didynamia, inclusa, basi labii superioris inserta, filamentis posticis brevioribus ; antherae posticae uniloculares, anticae biloculares, loculis parallelis subaequalibus muticis ; pollinis grana ellipsoidea, minute foveolata, fasciis duobus circa grana plus minusve contortis obturamenta 2 in sulcis parvis continentibus ornata. *Ovarium* biloculare, 4-ovulatum ; stigma bilobatum, lobis aequalibus rotundatis ciliolatis. *Capsula* ignota.

Thysanostigma siamense *Imlay*, sp. nov., adhuc unica.

Herba. *Caules* tenues, quadrangulares, sulcati, primo pilis saepe glandulosis puberuli, mox glabri, internodiis elongatis. *Folia* subaequalia, lanceolata vel ovato-lanceolata, apice acuta vel subacuta, basi cuneata vel breviter et inaequaliter attenuata, chartacea, lineolata, nervis pagina inferiore puberulis exceptis glabra, 7–13 cm. longa, 2·5–5 cm. lata, costa nervisque lateralibus utrinque 7–8 supra conspicuis subtus prominentibus, his intra marginem integrum superne arcuatis, petiolo 3·5–4 cm. longo sparse pubescente suffulta. *Spicae* axillares, simplices, c. 12 cm. longae, breviter glanduloso-pubescentes ; pedunculus 4 cm. longus ; flores solitarii, alterni, sessiles ; bracteae subopppositae, anguste lanceolatae, costatae, 7 mm. longae, 1·5 mm. latae, breviter glanduloso-pubescentes, sterilibus minoribus ; bracteolae lineares, 5 mm. longae,

breviter glanduloso-pubescentes. *Calyx* 5 mm. longus, extus glanduloso-pubescens, intus puberulus, margine glanduloso-ciliatus, lobis lineari-acuminatis 2 anterioribus paulo majoribus 2–3-nervibus. *Corolla* lutea, labio inferiore brunneo-maculato (ex *Kerr*), extus fere glabra, 1·8 cm. longa ; tubus erectus, cylindricus, 11 mm. longus, intus glaber ; labium posticum erectum, lanceolatum, apice emarginatum, 8 mm. longum, 4 mm. latum, anticum oblongum, 9 mm. longum, 6 mm. latum, breviter 3-lobatum, lobis rotundatis. *Stamina* 4, didynamia, basi labii postici affixa ; filamenta antica 4 mm. longa, glabra, antheras biloculares ferentia, postica 3 mm. longa, antheras uniloculares ferentia, loculis oblongis subaequalibus muticis 1·5 et 2 mm. longis. *Ovarium* glabrum ; stylus 1·5 cm. longus, glaber ; stigma breviter bilobatum, lobis aequalibus rotundatis patentibus ciliolatis.

PATTANI. Banang Sta, c. 100 m., in evergreen forest, *Kerr* 7388 ! (*type*) ; Betong, c. 200 m., climbing on rocks and trees, *Kerr* 7531 !

The genus is named from the very distinct stigma, which has two equal and rounded ciliolate lobes. This type of stigma is as yet unique among the *Acanthaceae*. The pollen grain, too, although of lesser importance, is unique, and does not fall readily into any of the groups classified by Lindau (Engl. Bot. Jahrb. **18,** 36–64 : 1893).

Thysanostigma can be related to *Filetia* Miq., but the stigma and the pollen together with the shorter posterior stamens bearing unilocular anthers are striking points of difference. The arrangement of the stamens and anthers, however, is similar to that of *Lepidagathis* Willd., but *Thysanostigma* differs in the calyx being subequally 5-lobed, as well as in the stigma and pollen.

Justicia quadrifaria (*Wall. ex Nees*) *T. Anders.* var. **salicifolia** (*T. Anders.*) *Imlay*, stat. nov.

Justicia salicifolia T. Anders. in Journ. Linn. Soc. **9,** 414 (1867).

Justicia muticitheca *Imlay*, nom. nov.

Dianthera debilis C. B. Clarke in Hook. f. Fl. Brit. Ind. **4,** 542 (1884), non Forssk.

Leptostachya debilis (C. B. Clarke) Hosseus in Engl. Bot. Jahrb. **41,** 73 (1907), in nota.

Ptyssiglottis debilis (C. B. Clarke) S. Moore in Journ. Bot. **60,** 355 (1922).

Dianthera debilis Forssk. (Fl. Aegypt-Arab. 9 : 1775) equals *Justicia debilis* (Forssk.) Lam. [*Monechma debile* (Forssk.) Nees], an Arabian species.

Justicia diacantha *Imlay*, sp. nov., a *J. bicalcarata* Craib bracteis 1 mm. latis, calyce glanduloso-pubescente, corolla 1·5 cm. longa extus pubescente, filamentis 7 mm. longis recedit.

Frutex. Rami quadrangulares, primo et in nodis pubescentes, demum lineis duobus puberulis ornati. *Folia* petiolata, aequalia, ovata, ad apicem subacutum vel obtusum attenuata, basi obtusa

vel rotundata, subcoriacea, obscure lineolata, supra glabra, nervis subtus molliter pubescentia, immatura densius pubescentia, 5–15 cm. longa, 2–9 cm. lata, costa nervisque lateralibus utrinque 7 supra conspicuis subtus prominentibus stramineis, nervis transversis conspicuis, margine subintegro, petiolo 1–3·5 cm. longo pubescente suffulta. *Racemi* terminales, simplices, 5–9 cm. longi, brevissime pedunculati, pubescentes; bracteae 6 mm. longae, 1–1·5 mm. latae, lanceolatae, acuminatae, pubescentes, costa obscura; bracteolae lineari-lanceolatae, 4–5 mm. longae, pubescentes. *Calyx* 6 mm. longus, extus pubescens, minute glandulosus; lobi lineari-acuminati, nervosi, 1 mm. lati, intus puberuli. *Corolla* extus molliter pubescens, 1·5 cm. longa; tubus limbo paulo longior, basi intus puberulus; labium superius ovatum, brevissime bilobatum; inferius usque ad medium trilobatum, intus glabrum. *Stamina* sub fauce corollae affixa, 7 mm. longa, basi pilis paucis instructa; antherae 1·5 mm. longae, basi calcaratae. *Ovarium* apice pubescens; stylus 10 mm. longus, basi pubescens.

RACHABURI. Prachuap, Sam Roi Yawt, *Put* 2500! (*type*). Pran, Ban Pak Tawan, 200 m., on limestone hill, *Marcan* 2602!

Justicia procumbens *Linn.* var. **glandulosa** *Imlay*, var. nov., a typo ramis primo pubescentibus, foliis pilis basi articulatis hirsutis, bracteis bracteolis spicisque dense breviter glanduloso-pubescentibus et ciliatis, capsula densius pubescente differt.

UDAWN. Lôi, Kao Krading, c. 1200 m., in open rocky ground, *Kerr* 20073!

Justicia suratensis *Imlay*, sp. nov., a *J. chlorantha* Craib foliis ellipticis vel oblanceolatis, inflorescentiae axi minute glanduloso-pubescente, corolla candida 10 mm. longa differt.

Rami subteretes, obscure angulares, glabri. *Folia* ovata vel ovato-lanceolata vel saepe lanceolata, ad apicem acutum acuminata, basi attenuata cuneata, chartacea, dense lineolata, glabra, 7–15·5 cm. longa, 3–8·5 cm. lata, costa nervisque lateralibus utrinque 6–7 supra conspicuis subtus prominentibus, nervis transversis obscuris, margine integro paulum recurvato, petiolo 0·5–2·5 cm. longo suffulta. *Spicae* terminales, simplices, solitariae, minute glanduloso-pubescentes; flores remoti, oppositi, sessiles, 2–3-nati, nunquam solitarii; bracteae cum bracteolis minutae, subglabrae. *Calyx* 2 mm. longus, minute puberulus; lobi lineari-acuminati, obscure 3-nerves. *Corolla* candida (ex *Kerr*), extus glabra, 10 mm. longa; tubus limbo paulo longior; labium superius erectum, subito angustatum, attenuatum, obtusum, integrum, inferius obovatum, patens, minute 3-lobatum. *Stamina* in fauce corollae affixa, 3 mm. longa, glabra; antherae loculi divergentes, inferior albo-caudatus. *Ovarium* glabrum; stylus 6 mm. longus, sparse pilosus. *Capsula* ignota.

SURAT. Panom, under 50 m., in evergreen forest, *Kerr* 12365! (*type*). King Panom, c. 100 m., in evergreen scrub, *Kerr* 18300!

Yanyao, c. 50 m., in evergreen forest at foot of limestone hill, *Kerr* 18192 !

Justicia vasculosa (*Wall. ex Nees*) *T. Anders.* var. **laxa** *Imlay*, var. nov., a typo foliis elliptico-lanceolatis glabris, paniculis laxis ramis ramosis patentibus glanduloso-pubescentibus, floribus raro geminatis differt.

PAYAP. Mê Kang, Mê Yom, 460 m., *Garrett* 132 ! (*type*). MAHARAT. Nan, Hui Sai, 240 m., in evergreen jungle, *Kerr* 2414 ! Hui Kua, c. 300 m., in evergreen by stream, *Kerr* 5029 !

Although this plant may be regarded as specifically distinct, the differences separating it from *J. vasculosa* are so slight as to make it more convenient to treat it as a variety.

Justicia fragilis *Wall. ex C. B. Clarke* var. **glandulosa** *Imlay*, var. nov., a typo floribus semper solitariis oppositis, bracteis oblongis obtusis 4–5 mm. longis calyce raro longioribus, bracteolis 3–4 mm. longis oblongis, calyce minute glanduloso-pubescente differt.

RACHABURI. Kanburi, Baw Noi, c. 700 m., *Kerr* 10249 ! (*type*) ; Sisawat, c. 200 m., in evergreen forest, *Kerr* 10224 !

Justicia trichocarpa *Imlay*, sp. nov., ab affini *J. pubiflora* C. B. Clarke foliis multo longioribus nervis lateralibus utrinque 11–12, calyce 7 mm. longo intus glanduloso-punctato, capsula dense pubescente recedit.

J. ventricosa Wall. var. *major* R. Ben. in Lec. Fl. Gén. Indo-Ch. **4,** 744 (1935) et in Not. Syst. **5,** 120 (1936).

Frutex usque 1·5 m. altus (ex *Kerr*). *Rami* subquadrangulares, pubescentes, primo dense fulvo-villosi. *Folia* petiolata, aequalia, oblongo-elliptica vel oblanceolato-elliptica, ad apicem acutum acuminata, basi elongata inaequaliter cuneata, chartacea, immatura basi laminae et nervorum dense breviter fulvo-villosa, matura subglabra, subtus nigro-punctata, usque 32 cm. longa, 7·5–10·5 cm. lata, costa supra prominula subtus prominente, nervis lateralibus utrinque 11–13 supra conspicuis subtus prominulis, nervis transversis subtus obscuris, margine subintegro minute denticulato, petiolo 5–7 cm. longo sulcato dense fulvo-villoso suffulta. *Spicae* terminales et in axillis superioribus, simplices, unilaterales, c. 19 cm. longae, dense pubescentes ; pedunculus 4–7 cm. longus, dense villosus ; bracteae in seriebus duabus dispositae, uniflorae, obovatae, apice rotundatae, basi breviter unguiculatae, 8–10 mm. longae, 7 mm. latae, 5-nerves, pubescentes, punctatae, margine pubescente ciliatae ; bracteolae spathulatae, apice acuminatae, acutae, curvatae, usque 10 mm. longae, 2 mm. latae, 3-nerves, indumento ei bractearum simili. *Calyx* 7 mm. longus, pubescens ; lobi aequales, lineari-acuminati, 3-nerves, intus nigro-punctati et apice pubescentes, margine ciliolati. *Corolla* subviridis (ex *Kerr*), extus pubescens, 1·4 cm. longa ; tubus 8 mm. longus, intus sub fauce pubescens ; labium superius 6 mm. longum,

ovatum, apice brevissime bilobatum ; inferius 3-lobatum. *Stamina* 5 mm. a basi corollae affixa, 7 mm. longa, basi pubescentia ; antherae loculus inferior albo-caudatus. *Ovarium* apice dense pubescens ; stylus 8 mm. longus, basi pilosus. *Capsula* 2·3 cm. longa, pubescens. *Semina* dense rugoso-verrucosa.

SURAT. Chumpawn, Ta Ngaw, c. 50 m., in evergreen forest, *Kerr* 11458 ! Siep Yuan, c. 20 m., at edge of evergreen forest, *Kerr* 16261 ! PUKET. Pang-nga, Tap-put, c. 100 m., by stream in evergreen forest, *Kerr* 18369 ! (*type*) ; Langkawi, Kesap, near Kuah, sea level, on limestone, *M. R. Henderson* 29176 ! *Curtis* 2117 !

The plant on which R. Benoist founded his var. *major* of *J. ventricosa* differs from *J. ventricosa* in many ways, especially in the bracts, inflorescence, capsule and leaves.

Justicia Kerrii *Imlay*, sp. nov., a *J. argyrostachya* (Wall. ex Nees) T. Anders. foliis supra dense lineolatis basi cuneatis haud longe attenuatis, spicis terminalibus raro axillaribus, bracteis apice minute glanduloso-puberulis, corolla 1·7 cm. longa differt.

Suffrutex circiter 1·5 m. altus (ex *Kerr*). *Rami* tenues, teretes, primo quadrangulares et lineis duobus pilorum brevium ornati. *Folia* petiolata, subaequalia, lanceolata vel ovato-lanceolata, aliquando elliptica, ad apicem acutum acuminata, basi cuneata, lineolata, glabra, chartacea, 7–16 cm. longa, 4–6·5 cm. lata. costa sparse pilosa supra conspicua subtus prominente, nervis lateralibus utrinque 7–8 supra conspicuis subtus prominulis, margine integro, petiolo 2–7 cm. longo supra pubescente suffulta. *Spicae* terminales, raro axillares, simplices, 4–8·5 cm. longae, brevissime pedunculatae ; flores oppositi, solitarii ; bracteae imbricatae, 4-seriatae, omnes fertiles, ovatae, acutae, subvirides nervis purpureis (ex *Kerr*), circiter 1·3 cm. longae, 1 cm. latae, apice tantum minute glanduloso-puberulae, margine purpureo longe ciliato ; bracteolae lanceolatae, scariosae, nervosae, 10 mm. longae, 3 mm. latae, margine ciliatae. *Calyx* 5 mm. longus, margine minute glanduloso-ciliatus ; lobi linearilanceolati, acuminati. *Corolla* rosea (ex *Kerr*), circiter 1·7 cm. longa, extus pubescens ; tubus limbo longior ; labium superius ovatum, obtusum, integrum, inferius breviter 3-lobatum. *Stamina* in fauce corollae affixa, 5 mm. longa, glabra ; antherae loculus inferior albo-caudatus. *Ovarium* pubescens ; stylus 1·3 cm. longus, sparse pilosa. *Capsula* 1·1 cm. longa, pubescens, placentis dehiscentia non elasticis.

CHANTABURI. Krat, Takum, c. 50 m., bracts white veined brown, in evergreen forest, *Kerr* 17852 ! Baw Rai, c. 400 m., in evergreen forest, *Kerr* 9481 ! SURAT. Chumpawn, Ta Ngaw, c. 100 m., common in evergreen forest, *Kerr* 11569 ! PUKET. Ranawng, Kao Pawta Luang Kêo, c. 500 m., on rocky ground by stream in evergreen forest, *Kerr* 16900 ! (*type*). NAKAWN SRITAMARAT. Wat Kiriwong, c. 100 m., in evergreen forest, *Kerr* 15592 ! Tungsong *Put* 2383 ! Khao Ram, *Eryl Smith* 677 !

Justicia decurrens *Imlay*, sp. nov., a *J. Kurzii* C. B. Clarke foliis oblongo-lanceolatis angustatis basi petiolo alato subauriculatis nervis lateralibus utrinque 11, bracteolis calyce brevioribus lanceolatis, calyce 7 mm. longo, corolla 1·5 mm. longa, capsula 1·7–2·2 cm. longa differt.

Frutex usque 2 cm. altus (ex *Kerr*). *Rami* obtuse quadrangulares, fere glabri. *Folia* aequalia, oblonga vel oblongo-lanceolata, ad apicem acutum acuminata, basi attenuata petiolo alato demum auriculata, lineolata, glabra, costa supra pubescente excepta, chartacea, 13–26 cm. longa, 4–8 cm. lata, costa supra depressa conspicua subtus prominente, nervis lateralibus utrinque 9–11 supra conspicuis subtis prominulis ascendentibus, margine integro scabrido-pubescente, petiolo 3–5 mm. longo alato suffulta. *Spicae* terminales, raro axillares, 6–10 cm. longae, breviter pedunculatae; flores oppositi, solitarii; bracteae laxe imbricatae, 4-seriatae, omnes fertiles, ovatae, acuminatae, 1·5 cm. longae, 8 mm. latae, glabrae, nervosae, margine breviter ciliatae; bracteolae calyce multo breviores, 3 mm. longae, 1 mm. latae, lanceolato-acuminatae, margine breviter ciliatae. *Calyx* 7 mm. longus; lobi oblongo-acuminati, 3-nerves, breviter ciliati. *Corolla* extus pubescens, 1·5 cm. longa; tubus basi intus puberulus; labium superius ovatum, obtusum, integrum, inferius transverse nervosum, 3-lobatum. *Stamina* sub fauce corollae affixa, subexserta, 7 mm. longa, glabra; antherae loculus inferior albo-caudatus. *Ovarium* fere glabrum; stylus 1·1 cm. longus, basi sparse pilosus. *Capsula* 1·7–2 cm. longa, dense pubescens.

Payap. Mûang Fang, Doi Pahom Pok, c. 1900 m., in dense evergreen forest, *Kerr* 5192 ! (*type*); Chiengmai, Doi Ka, 1430 m., in evergreen forest, *Winit* 1428 !

Justicia oligoneura *Imlay*, sp. nov., ab affini *J. punduana* (Wall. ex Nees) C. B. Clarke foliorum nervis lateralibus utrinque 6–7, bracteolis calyce minoribus, calyce 8 mm. longo, corolla 1·5 cm. longa recedit.

Suffrutex. *Rami* teretes, primo lineis duabus pubescentibus ornati, demum glabri. *Folia* petiolata, subaequalia, elliptica, apice basique acuta, lineolata, supra glabra, subtus nervis villoso-pubescentia, subcoriacea, 6–13 cm. longa, 2–6 cm. lata, costa supra conspicua subtus prominente, nervis lateralibus utrinque 5–7 conspicuis intra marginem ascendentibus, nervis transversis obscuris, margine integro, petiolo 1–3 cm. longo pubescente suffulta. *Spicae* terminales, saepe 2–3-natae et axillares, 2–4 cm. longae, brevissime pedunculatae; flores solitarii, alterni; bracteae dense imbricatae, 4-seriatae, seriebus 2 sterilibus, ovatae, fere rhomboideae, acutae, nervosae, extus pubescentes, intus glabrae, 1·2 cm. longae, 10 mm. latae, margine scarioso purpureo; bracteolae oblongae vel oblanceolatae, mucronatae, calyce breviores, 7 mm. longae, 1·5 mm. latae, pubescentes, 1-nerves. *Calyx* 8 mm. longus, pubescens, cum pilis multis glandulosis; lobi lineari-setacei, 1-nerves. *Corolla*

candida, labio inferiore purpureo-maculato (ex *Kerr*), 1·5 cm. longa, extus pubescens ; tubus limbo longior, intus sub fauce puberulus ; labium superius brevius, acutum, integrum, inferius 6 mm. longum, breviter 3-lobatum. *Stamina* sub fauce corollae affixa, 3 mm. longa, glabra ; antherae loculi dorso minute pubescentes, inferior albo-caudatus. *Ovarium* glabrum ; stylus 8 mm. longus, basi sparse pilosus. *Capsula* 8 mm. longa, pubescens ; placentae dehiscentia a basi elastice superne curvatae.

SURAT. Langsuan, Kao Nom Sao, c. 300 m., in evergreen forest, *Kerr* 12014 ! (*type*). PUKET. Ranawng, Kaw Chang, c. 5 m., in evergreen forest, *Kerr* 16560 ! La-un, c. 50 m., in evergreen forest, *Kerr* 16511 !

Justicia polyneura *Imlay*, sp. nov., ab affini *J. punduana* (Wall. ex Nees) C. B. Clarke foliis supra pilis brevibus sparse vestitis basi rotundatis, nervis lateralibus utrinque 12–16, petiolis 3–8 cm. longis, bracteis pubescentibus differt.

Suffrutex. *Caules* primo subquadrangulares, lineis duabus pilorum brunneorum crispatorum ornati, demum cylindrici et glabri. *Folia* longe petiolata, subaequalia, oblongo-lanceolata, raro elliptica, ad apicem acutum acuminata, basi rotundata, aliquando inaequaliter cuneata, supra albo-punctata, pilis setulosis sparsis ornata, subtus lineolata, nervis dense pubescentia, 9–18 cm. longa, 5–7 cm. lata, costa nervisque lateralibus utrinque 12–16 supra conspicuis subtus prominulis, his apice anastomosantibus, nervis transversis subtus conspicuis, margine integro, petiolo 2·5–7·5 cm. longo pubescente suffulta. *Spicae* terminales et in axillis supremis, 4–6 cm. longae, brevissime pedunculatae ; flores solitarii ; bracteae imbricatae, 4-seriatae, seriebus 2 sterilibus, obovatae, acuminatae, nervosae, sparse pilosae, 1–1·5 cm. longae, 8–11 mm. latae, margine scarioso sparse ciliato ; bracteolae angustae, oblongae, ad apicem longe acuminatae, 9 mm. longae, 1 mm. latae, sparse pilosae et ciliatae. *Calyx* 6 mm. longus, pubescens ; lobi lineari-acuminati, 1-nerves. *Corolla* extus fere glabra, 1·3 cm. longa ; labium superius 4 mm. longum, integrum, inferius 6 mm. longum, oblongum, breviter 3-lobatum. *Stamina* sub fauce corollae affixa, 4 mm. longa, glabra ; antherae loculi lineares, dorso minute pubescentes, inferior albo-caudatus. *Ovarium* glabrum ; stylus 6 mm. longus, glaber. *Capsula* 8 mm. longa, apice sparse pilosa ; placentae dehiscentia a basi superne curvatae.

PUKET. Ranawng, La-un, c. 50 m., *Kerr* 17512 ! (*type*). Pang-nga, Kao Bangto, c. 900 m., by stream in evergreen forest, *Kerr* 17211 !

Justicia adnata *Imlay*, sp. nov., ab affini *J. secundiflora* Ridley caulibus glabris, foliorum nervis lateralibus utrinque 10, pedunculis 3 cm. longis, bracteis posticis sterilibus axi oblique adnatis glabris, corolla 2 cm. longa pubescente recedit.

Caules subteretes, glabri. *Folia* petiolata, subaequalia, oblanceolata, ad apicem subacutum breviter acuminata, basi attenuata, lineolata, nervis subtus pubescentia, chartacea, 12–21 cm. longa, 5·5–9·5 cm. lata, costa supra conspicua subtus compressa prominula, nervis lateralibus utrinque 10 subtus conspicuis intra marginem subintegrum anastomosantibus, nervis transversis subtus conspicuis, petiolo 1–3·5 cm. longo glabro suffulta. *Spicae* terminales, simplices, solitariae, unilaterales, c. 5 cm. longae ; pedunculi 2–3·5 cm. longi ; flores solitarii, alterni ; bracteae imbricatae, 4-seriatae, eae serierum 2 posteriorum steriles et axi oblique adnatae, lanceolatae, acutae, albo-punctatae, margine sparse scabrido-ciliatae, costa excentrica, nervis lateralibus intra marginem anastomosantibus, 1·5 cm. longae, 5 mm. latae ; bracteolae ellipticae, obtusae, apice apiculatae, 1-nerves, obscure lineolatae, margine sparse ciliatae. *Calyx* 7 mm. longus ; lobi lineari-acuminati, 1-nerves, glandulis multis parvis subsessilibus ornati. *Corolla* candida (ex *Eryl Smith*), 2 cm. longa, extus sparse pubescens ; tubus limbo longior, intus basi puberulus ; labium posticum 6 mm. longum, apice obtusum, integrum, anticum 8 mm. longum, breviter 3-lobatum. *Stamina* sub fauce corollae affixa, 6 mm. longa, glabra ; antherae loculi 2 mm. longi, inferior albo-caudatus. *Ovarium* glabrum ; stylus 1·5 cm. longus, basi sparse pilosus. *Capsula* ignota.

NAKAWN SRITAMARAT. Kao Luang, 1740 m., in jungle, *Eryl Smith* 736 ! (*type*) ; 900–1100 m., in evergreen forest, *Kerr* 15462 !

Justicia subtilifolia *Imlay*, sp. nov., a *J. burmannica* C. B. Clarke caulibus glabris, foliis membranaceis glabris costa nervisque compressis glabris, bracteis imbricatis exsiccatis sub-brunneis haud lineolatis margine anguste scarioso recedit.

Frutex (?), usque 0·75 m. altus (ex *Kerr*). *Rami* obtuse quadrangulares, glabri. *Folia* petiolata, subaequalia, elliptica vel lanceolato-elliptica, ad apicem acutum acuminata, basi acuta, obscure lineolata, glabra, membranacea, 9–22 cm. longa, 4–8·5 cm. lata, costa compressa nervisque lateralibus utrinque 11–13 conspicuis, his intra marginem integrum anastomosantibus, petiolo 2·5–4·5 cm. longo glabro suffulta. *Spicae* terminales, aliquando in axillis supremis, simplices, 5–18 cm. longae ; pedunculi 3 cm. longi ; flores alterni, solitarii ; bracteae grandes, imbricatae, 4-seriatae, eae serierum 2 posteriorum steriles, majores, obovato-orbiculares, apice rotundatae, nervosae, membranaceae, glabrae, 1·5–2·5 cm. longae, 1–2 cm. latae, margine anguste scarioso purpureo-tincto ; bracteolae ellipticae, acuminatae, calyce longiores, 10 mm. longae, glabrae, scariosae, 1-nerves. *Calyx* 6 mm. longus, glaber, lobis lineari-acuminatis 1-nervibus punctatis. *Corolla* 2 cm. longa, extus glabra, tubus limbo longior ; labium posticum ovatum, subacutum, integrum, 6 mm. longum, anticum 10 mm. longum, breviter 3-lobatum. *Stamina* sub fauce corollae affixa, 5 mm. longa, glabra ; antherae loculi oblongi, 2 mm. longi, inferior albocandatus. *Ovarium* glabrum ; stylus 1·3 cm. longus, basi sparse

pilosus. *Capsula* 1·2 cm. longa, glabra ; placentae a basi elastice superne curvatae.

PUKET. Satul, Kao Keo Range, c. 700 m., in evergreen forest, *Kerr* 14529 !

Justicia graphocaula *Imlay*, sp. nov., *J. glabrae* Koen. ex Roxb. proxima, sed foliis exsiccatis nigris, caulibus robustis conspicue nigrostriatis, cymis axillaribus 2–3-natis petiolo multo brevioribus, corolla subviridi, seminibus verrucoso-rugosis recedit.

Frutex c. 1·5 m. altus (ex *Kerr*). *Ramuli* teretes, glabrescentes, nigro-striati. *Folia* petiolata, aequalia vel subaequalia, ovata et late ovata, ad apicem acutum acuminata, basi subito angustata et cuneata vel breviter attenuata, saepe inaequaliter, exsiccata subnigra, lineolata, supra glabra, subtus nervis puberula, 6·5–15 cm. longa, 3·5–8·5 cm. lata, costa supra conspicua subtus subprominente, nervis lateralibus utrinque 7, margine integro vel subintegro, petiolo 1·5–4 cm. longo glabrescente suffulta. *Flores* in cymis axillaribus breviter pedunculatis saepe 2–3-natis petiolo brevioribus dispositi ; pedunculi 5–8 mm. longi, puberuli ; bracteae bracteolaeque minutae, triangulares, puberulae, 1–1·5 mm. longae. *Calyx* 2 mm. longus, extus puberulus ; lobi lineari-lanceolati, acuminati, intus apice puberuli. *Corolla* subviridis (ex *Kerr* 18227), extus pubescens, 9–10 mm. longa ; tubus limbo paulo longior, intus fauce pubescens ; labium superius emarginatum, inferius 3-lobatum, lobo medio latiore. *Stamina* in medio tubo affixa, 4 mm. longa, glabra ; antherae loculus inferior albo-caudatus. *Ovarium* apice tantum pubescens ; stylus 8 mm. longus, a basi pilosus. *Capsula* 1·5–2 cm. longa, pubescens. *Semina* verrucoso-rugosa, glabra.

SURAT. King Panom, c. 100 m. in evergreen scrub, *Kerr* 18301 ! Yanyao, c. 50 m., in evergreen forest, at foot of limestone hill, *Kerr* 18227 ! Ta Kanawn, under 50 m., in scrub, *Kerr* 12322 ! PUKET. Krabi, c. 50 m., in evergreen on rocky limestone hill, *Kerr* 18846 ! Krabi, Ao Lûk, c. 50 m., in scrub on limestone rocks, *Kerr* 18574 ! (*type*).

Local Name : *Yai Klang*.

Justicia oligantha *Imlay*, sp nov., a *J. vasculosa* (Wall. ex Nees) T. Anders. foliis majoribus, spicis semper paniculatis, floribus remotis 3-natis raro solitariis, medio pedunculo foliis parvis sessilibus instructo differt.

Ramuli erecti, lignei, teretes, supra nodos constricti, primo lineis duobus oppositis pubescentibus ornati, demum glabri. *Folia* aequalia vel subaequalia, suprema sessilia ovata, cetera petiolata, elliptica, ad apicem acutum breviter acuminata, basi attenuata, lineolata, glabra, 8–23 cm. longa, 3·5–9 cm. lata, costa supra conspicua subtus prominente, nervis lateralibus utrinque 6–7 supra conspicuis subtus prominulis, nervis transversis conspicuis, margine subintegro, petiolo 1–3 cm. longo suffulta. *Spicae* terminales et in axillis supremis, paniculatae, ramis ascendentibus, subglabrae,

longe pedunculatae ; flores oppositi, 3-nati, raro solitarii, subsessiles ; bracteae angustae, lanceolatae, acutae, 2 mm. longae, puberulae ; bracteolae minores, ceteroquin similes. *Calyx* 2·5 mm. longus, minute puberulus ; lobi subaequales, lineares, acuti. *Corolla* candida, labio inferiore roseo-maculato (ex *Kerr*), 10 mm. longa, extus puberula ; labium superius erectum, breviter attenuatum, obtusum, integrum, inferius longius obovatum breviter 3-lobatum. *Stamina* in fauce corollae affixa, 3 mm. longa, glabra ; antherae loculi divergentes, inferior conspicue albo-caudatus. *Ovarium* glabrum ; stylus 7 mm. longus, sparse pilosus. *Capsula* 1·4 cm. longa, longe stipitata, glabra.

RACHASIMA. Chaiyapum, Nawng Bua Dêng, c. 300 m., in evergreen forest, *Kerr* 20311 !

Justicia pallida *Imlay*, sp. nov., a *J. vasculosa* (Wall. ex Nees) T. Anders. foliis angustis usque 8 cm. longis subsessilibus, spicis c. 5 cm. longis glanduloso-pubescentibus, sepalis anguste lineari-acuminatis differt.

Caules c. 30 cm. longi, tenues, erecti, aliquando basi prostrati, teretes, obscure angulares, duobus lineis puberulis exceptis glabri. *Folia* aequalia vel subaequalia, sessilia vel subsessilia, lanceolata, apice acuta, basi obtusa, chartacea, exsiccata subtus pallidissima, lineolata, glabra, 3–8 cm. longa, 1–3 cm. lata, costa subtus puberula nervisque lateralibus utrinque 6 supra conspicuis subtus prominentibus, margine integro subrecurvato, petiolo 0–5 mm. longo suffulta. *Spicae* terminales, basi raro ramosae, c. 5 cm. longae, glanduloso-pubescentes ; flores oppositi, solitarii vel bini, sessiles ; bracteae angustae, lanceolatae, acutae, 4 mm. longae, glanduloso-pubescentes ; bracteolae anguste lineares, ceteroquin similes. *Calyx* 4–5 mm. longus, glanduloso-pubescens et ciliatus ; lobi lineari-acuminati. *Corolla* extus pubescens, 8–10 mm. longa ; labium superius erectum, anguste attenuatum, subacutum, emarginatum, inferius patens, breviter 3-lobatum. *Stamina* in fauce corollae affixa, 3 mm. longa, glabra ; antherae loculi divergentes, inferior brevissime albo-caudatus. *Ovarium* dense minute pubescens ; stylus 6 mm. longus, sparse pilosus. *Capsula* 11 mm. longa, pubescens.

PAYAP. Chiengrai, Muang Pan, c. 450 m., growing in bamboo jungle, *Kerr* 5114 ! (*type*). Chiengkien, near Chiengrai, 390 m., by roadside, *Kerr* 2484 ! Lampun, Mê Ta, 340 m., in bamboo jungle, *Kerr* 3629 ! PITSANULOK. Nakawn Tai, c. 200 m., in bamboo jungle, *Kerr* 5879 ! SURAT. King Panom, c. 100 m., in evergreen forest, *Kerr* 18342 ! PUKET. Takuapa, Raichawng, c. 50 m., in evergreen forest, *Kerr* 17030 ! PATTANI. Banang Sta, c. 100 m., in evergreen forest, *Kerr* 7361 ! Kao Kalakiri, 600–700 m., in evergreen forest, *Kerr* 14937 ! (?)

The collections from Peninsular Siam, viz., *Kerr* 18342, 17030, 7361, have slightly longer petioles, and the leaves are more acute at the base. *Kerr* 14937 is included doubtfully.

Justicia tenuissima *Imlay*, sp. nov., a *J. vasculosa* (Wall. ex Nees) T. Anders, paniculae laxae ramis tenuissimis patentibus minute glanduloso-pubescentibus, floribus remotis oppositis sed altero aborto, bracteis calyce multo minoribus differt.

Caules c. 60 cm. alti, erecti, subteretes, primo lineis duobus pubescentibus ornati. *Folia* subaequalia, ovata, ad apicem acutum acuminata, basi subito attenuata, chartacea, obscure lineolata, supra et subtus nervis pilosa, pilis sparsis appressis pluricellularibus, 7–12 cm. longa, 3·5–7 cm. lata, costa nervisque lateralibus utrinque 6–7 supra conspicuis subtus prominulis, margine integro, suprema sessilia, cetera petiolo 1–4 cm. longo suffulta. *Paniculi* terminales, laxi, c. 13–20 cm. longi, ramis tenuissimis patentibus minute glanduloso-pubescentibus ; flores remoti, solitarii, oppositi, altero saepissime sterili, breviter pedicellati ; bracteae minutae, lineari-acutae, 1 mm. longae ; bracteolae similes. *Calyx* 2 mm. longus, minute glanduloso-pubescens, lobis acutis. *Corolla* candida, apice purpurea (ex *Kerr*), extus pubescens, 10 mm. longa ; tubus limbo multo longior ; labium superius subito angustatum, subintegrum, inferius breviter 3-lobatum. *Stamina* in fauce corollae affixa, 2 mm. longa, glabra ; antherae loculi divergentes, inferior conspicue albo-caudatus. *Ovarium* subglabrum ; stylus 6 mm. longus, sparse pilosus. *Capsula* 10 mm. longa, pubescens.

Rachaburi. Kanburi, Wangka, c. 200 m., in bamboo forest by dry stream, *Kerr* 10495 ! (*type*). Surat. Klawng Nam Wing, c. 200 m., common in evergreen forest, *Kerr* 12225 ! Ban Krut, c. 50 m., by stream in evergreen forest, *Kerr* 18165 ! Langsuan, Tako, *Put* 1731 ! Puket. Takuapa, Nang Yawn, c. 10 m., in scrub, *Kerr* 17046 !

Justicia distincta *Imlay*, sp. nov., *J. candidae* R. Ben. proxima, sed foliis conspicue albo-nervosis basi attenuatis, spicis simplicibus brevibus c. 5 cm. longis compactis pedunculis 1·5 cm. longis suffultis, bracteis minoribus glabris, calyce glanduloso-ciliato recedit.

Frutex c. 0·5 m. altus (ex *Kerr*). *Rami* teretes, glabri, cortice griseo rugoso obtecti. *Folia* subaequalia, breviter petiolata, elliptica, apice acuta, basi attenuata, lineolata, glabrata, 10–17 cm. longa, 2·5–5·5 cm. lata, costa nervisque lateralibus utrinque 7–8 supra conspicuis subtus prominentibus, his superne arcuatis intra marginem subintegrum anastomosantibus, nervulis subtus conspicuis, petiolo 0·5–1·5 cm. longo suffulta. *Spicae* terminales, simplices vel basi ramosae, c. 8 cm. longae, subglabrae ; flores oppositi, solitarii, subsessiles ; bracteae bracteolaeque 1 mm. longae, lanceolatae, minute ciliolatae. *Calyx* 2·5–3 mm. longus ; lobi lanceolati, acuti, minute glanduloso-ciliolati, 3-nerves. *Corolla* candida, labio inferiore rubro-maculato (ex *Kerr*), 1·5 cm. longa, extus glabra ; tubus limbo multo longior, intus basi puberulus, vix curvatus ; labium superius ovatum, obtusum, erectum, integrum, inferius patens, breviter 3-lobatum. *Stamina* in fauce corollae affixa, 3 mm. longa, glabra ; antherae loculus inferior albo-caudatus.

Ovarium glabrum ; stylus 11 mm. longus. *Capsula* 1·8 cm. longa, glabra. *Semina* glabra, verrucoso-rugosa.

RACHABURI. Kanburi, Kao Ri Yai, c. 1200 m., in evergreen forest, *Kerr* 10369 !

Rungia diversibracteata *Imlay*, sp. nov., a *R. membranacea* Merrill petiolo circiter 3 cm. longo, spicis terminalibus solitariis circiter 6 cm. longis, bracteis posticis sterilibus membranaceis 1·2 cm. latis anticis fertilibus ellipticis 5 mm. latis pubescentibus margine glanduloso-ciliatis facile distinguenda.

Herba (?). *Caules* tenues, teretes, virides, glabri. *Folia* petiolata, parum inaequalia, ovata vel ovato-lanceolata, ad apicem acutum acuminata, basi acuta, lineolata, supra sparse setulosa, chartacea, 8–13·5 cm. longa, 3–5·8 cm. lata, costa supra conspicua subtus compressa et prominula, nervis lateralibus utrinque 6–7 conspicuis, margine integro, petiolo 1·5–3 cm. longo lineolato glabro suffulta. *Spicae* terminales, densae, 2·5–6 cm. longae, breviter pedunculatae ; flores solitarii, alterni ; bracteae quadrifariae, dissimiles, posticae steriles, dense imbricatae, late obovatae, breviter acuminatae, 1·2–1·5 cm. longae, 1–1·2 cm. latae, nervosae, extus pubescentes, margine minute glanduloso-ciliatae, anticae fertilibus alternae, haud dense imbricatae, membranaceae, nervosae, 1·1 cm. longae, 5 mm. latae, ellipticae, obtusae, pubescentes, margine minute glanduloso-ciliatae ; bracteolae lineari-lanceolatae, acuminatae, 10 mm. longae, 1 mm. latae, breviter pubescentes, margine glanduloso-ciliatae. *Calyx* 6 mm. longus, pubescens, cum pilis multis glandulosis, lobis lineari-lanceolatis acuminatis scariosis. *Corolla* flavescens, purpureo-maculata (ex *Kerr*), extus glanduloso-pubescens, 1·7 cm. longa ; tubus limbo longior, intus subglaber ; labium superius emarginatum, inferius brevius, hujus lobis medio emarginatis. *Stamina* in fauce corolla inserta, 3·5 mm. longa, glabra ; antherae loculus inferior conspicue albo-caudatus ; connectivus inter lobulos expansus. *Ovarium* glabrum ; stylus 1·1 cm. longus, basi sparse pilosus. *Capsula* ignota.

PUKET. Ranawng, Kao Pawta Luang Keo, 1000–1200 m., in evergreen forest, *Kerr* 16941 !

In the absence of a mature capsule this plant might equally well be a *Justicia*.

Rungia tenuissima *Imlay*, sp. nov., a *R. himalayensi* C. B. Clarke foliis subsessilibus, spicis multo latioribus, bracteis alte scarioso-marginatis albo-pilosis et minute glanduloso-pubescentibus 9 mm. latis, capsula apice glanduloso-pubescente differt.

Caules erecti, c. 30 cm. longi, tenues, ramosi, primo pilis deflexis brevibus in lineis duabus ornati. *Folia* subsessilia, aequalia, ovata vel ovato-lanceolata, apice acuta, basi rotundata, pauca ex maturis basi acuta vel breviter attenuata, chartacea, lineolata, subglabra, exsiccata supra brunnea subtus pallidiora, 2–5·5 cm. longa, 1·3–2 cm. lata, costa nervisque lateralibus utrinque 5–6 supra sub-

obscuris subtus prominulis, his arcuatis, nervis transversis obscuris, margine integro breviter piloso, petiolo usque 2 mm. longo pubescente suffulta. *Spicae* densae, c. 1·5–2·5 cm. longae, 1–1·5 cm. latae ; pedunculi filiformes, tenuissimi, axillares, aliquando articulati, 2·5–5 cm. longi, minute glanduloso-pubescentes et saepe pilosi ; bracteae imbricatae, quadrifariae, seriebus 2 posticis sterilibus, ovatae, apiculatae, alte scarioso-marginatae, apice purpureae, 8–9 mm. longae, 8–10 mm. latae, sparse pilosae et apice minute glanduloso-pubescentes, ciliolatae, costa nervisque lateralibus utrinque 3 conjunctis conspicuis ; bracteolae lineares, acuminatae, 6 mm. longae, minute glanduloso-pubescentes. *Calyx* 5–6 mm. longus, minute glanduloso-pubescens, lobis lineari-acuminatis. *Corolla* purpurea (ex *Kerr*), extus pubescens, cum pilis multis glandulosis, 8 mm. longa ; tubus limbo parum longior ; labium superius subintegrum, inferiore brevius. *Stamina* sub fauce corollae affixa, filamentis glabris corollae labio inferiore brevioribus ; antherae loculi inferiores albo-caudati. *Capsula* 3 mm. longa, minute pubescens, apice pilis paucis glandulosis instructa. *Semina* minute verrucosa.

Rachaburi. Kanburi, Ta Kanun, c. 400 m., in mixed forest, *Kerr* 10285 ! (*type*). Wangka, c. 200 m., in bamboo forest, *Kerr* 10464 !

Dicliptera (?) **siamensis** *Imlay*, sp. nov., a *D. Beddomei* C. B. Clarke foliis saepissime lanceolatis minoribus fere glabris breviter petiolatis, bracteis longioribus haud spatulatis, antherae loculis dissimilibus superiore oblongo inferiore ovoideo minore, et a *Peristrophe bicalyculata* Nees inflorescentia axillari cymosa 3-ramosa pauciflora glanduloso-pubescente nec laxe divaricatim paniculata, bracteis et calyce omnino viridibus, corolla c. 1·8 cm. longa, antherae loculis dissimilibus differt.

Herba erecta, tenuis, basi prostrata, c. 32 cm. alta (ex *Kerr*). *Caules* 6-sulcati, lineolati, primo sparse puberuli, demum glabrescentes. *Folia* subaequalia, lanceolata vel oblongo-lanceolata, ad apicem subacutum breviter acuminata, basi obtusa vel rotundata, lineolata, costa nervisque subtus pubescentibus exceptis fere glabra, 4–7 cm. longa, 2–3·5 cm. lata, costa plana et nervis lateralibus utrinque 6 conspicuis, nervis transversis multis supra obscuris, margine integro, petiolo 0·3–1·5 cm. longo puberulo suffulta. *Inflorescentia* axillaris, cymosa, trichotoma, pauciflora, pilis albis patentibus brevissimis glandulosis pubescens, pedunculo tenui c. 2·5–5 cm. longo suffulta ; pedicelli 0·5–1·5 cm. longi ; bracteae oppositae, inaequales, flores 1–2 includentes, glanduloso-puberulae, omnino virides, posterior minor, c. 10 mm. longa, 0·5 mm. lata, angusta, lineari-acuminata, anterior major, 1·5–1·7 cm. longa, c. 2 mm. lata, oblongo-linearis, apice acuta brevissime apiculata, costa conspicua ; bracteolae lineari-acuminatae, 5–7 mm. longae, glanduloso-puberulae. *Calyx* minute glanduloso-pubescens, 4 mm. longus, lobis lineari-acuminatis basi per 1 mm. connatis. *Corolla*

purpurea (ex *Kerr*), extus pubescens, 1·8–2·2 cm. longa, tubo 1 cm. longo, labio postico apice subintegro, antico breviter 3-lobato. *Stamina* 1 cm. longa, glabra, exserta ; antherae loculi dissimiles, superiore oblongo 1 mm. longo, inferiore ovoideo 0·5 mm. longo. *Ovarium* glabrum ; stylus 2·2 cm. longus, glaber. *Capsula* ignota.

RACHABURI. Kanburi, Baw Noi, c. 700 m., on rocks in evergreen forest, *Kerr* 10261 !

The absence of the mature capsule makes the genus of this plant uncertain. The dissimilar anther cells agree neither with *Dicliptera* nor with *Peristrophe*, according to the recognized definitions of those two genera. The presence of ovoid anther cells in *Peristrophe bicalyculata*, and of linear anther cells in *Dicliptera reptans*, makes any distinction between the two genera, based on characters other than that of the mature capsule, very unsatisfactory. The two genera could well be united under the older name of *Dicliptera* Juss., the species being grouped according to the character of the anther cells.

XIV—MASS FRUITING OF ELMS IN RELATION TO THE WEATHER. R. MELVILLE.

The spring of 1938 was notable for the abundance of elm fruit in many areas in southern England. The phenomenon was not limited to one or two species but all forms were alike in their fecundity including the common English elm, *Ulmus procera* Salisb., which had not produced fruit in any quantity for a number of years. Fruit from several trees of this species was examined and an attempt was made to germinate some of the plumper fruits from two trees at Kew and two in different parts of Hertfordshire. Not a single seedling was obtained from these, though three seedlings were raised from fruits of one of six seedling elms presented by the late Prof. Henry to Kew. These seedlings, of which there were originally seven, were grown from the seed of old trees of *U. procera* growing in the gardens of the Royal Palace of Aranjuez in Spain. As they were raised in 1911 they are now 27 years old and have been flowering for some years. Unfortunately the pollen parent is not known for either generation, but it is evident that *U. procera* is not sterile, as has been suggested. Seedlings were also raised this year from the Kew trees of *U. laevis* Pall., *U. laevis* var. *glabra* Schneid., *U. stricta* Lindl. var. *sarniensis* (Loud.) Moss, *U. glabra* Huds. and × *U. Dauvessei* Henry and from several wild trees including *U. Plotii* Druce. *U. Dauvessei*, a hybrid of *U. glabra* of unknown origin, produced a number of abnormal fruits with a tri-radiate wing. In these a flange, like half of a samara, projected from one side of the samara in the median longitudinal plane. Some of the abnormal fruits appeared to be fertile.

There are few records of widespread and abundant fruiting of elms in England ; the last occasion worthy of special notice was in 1909. In this year Prof. Henry sowed seeds from 90 trees,

some being obtained from Kew, and raised a large number of seedlings (1). He failed to obtain seedlings from English seed of *U. procera* although successful with most of the other species and hybrids that he tried. Henry concentrated his attention on the raising of seedlings, mainly with the object of throwing light on the relationships of the different kinds. He gives little information on the weather conditions that led up to the phenomenon of mass fruiting beyond mentioning the mildness of the preceding autumn and stating that " in the months of March, April and May 1909 the amount of sunshine in the South of England was greater than had ever before been recorded by the meteorologists." The widespread nature of the phenomenon and its effect on the trees was discussed in some detail by Miller Christy (2). In his account he mentions the prodigious quantity of seed observed towards the end of April and says that the trees produced little or no foliage. By mid-May trees looked as if killed in full leaf, so thickly were they covered by the brown winged fruits. The foliage was late in its appearance and also there was much less of it than usual. Miller Christy thought the great abundance of fruit was due to an unusual combination of favourable circumstances, notably the mild and genial autumn of 1908 ripening the wood and the exceptionally fine weather of March, April and May 1909. In 1910 scarcely any elm fruits were to be found, the trees having exhausted themselves the preceding year. This explanation of the failure of the elms to fruit in 1910 is probably the correct one, since intermittent fruiting of this type is a well known phenomenon in fruit trees. The causes leading to the abundant fruiting of elms at long and irregular intervals are much more obscure. That this is so was realised by Miller Christy for he remarks that " we have had many such autumns without any such result following." Further, it is common knowledge that in most seasons elms produce an abundance of flower and but little fruit.

The nature of the factors controlling the fruiting of elms has not been investigated. It was considered worth while therefore to make an examination of the available data relating to the flowering and fruiting of elms during the years 1936–38, and 1909 in conjunction with the meteorological records. For this purpose records of daily maximum and minimum screen temperatures and Campbell-Stokes sunshine records for the relevant periods were obtained from the Kew Observatory. Some records of the flowering times of the elms at Kew were available for the years 1936–38 and the herbarium was searched for flowering specimens of elms collected in 1909 to determine if possible the date of flowering of the different species in that year. Unfortunately a single specimen of *Ulmus glabra* Huds. was all that could be found. Neither Henry nor Miller Christy mentions the times of flowering of the elms in 1909 and a search of other botanical literature yielded no further information.

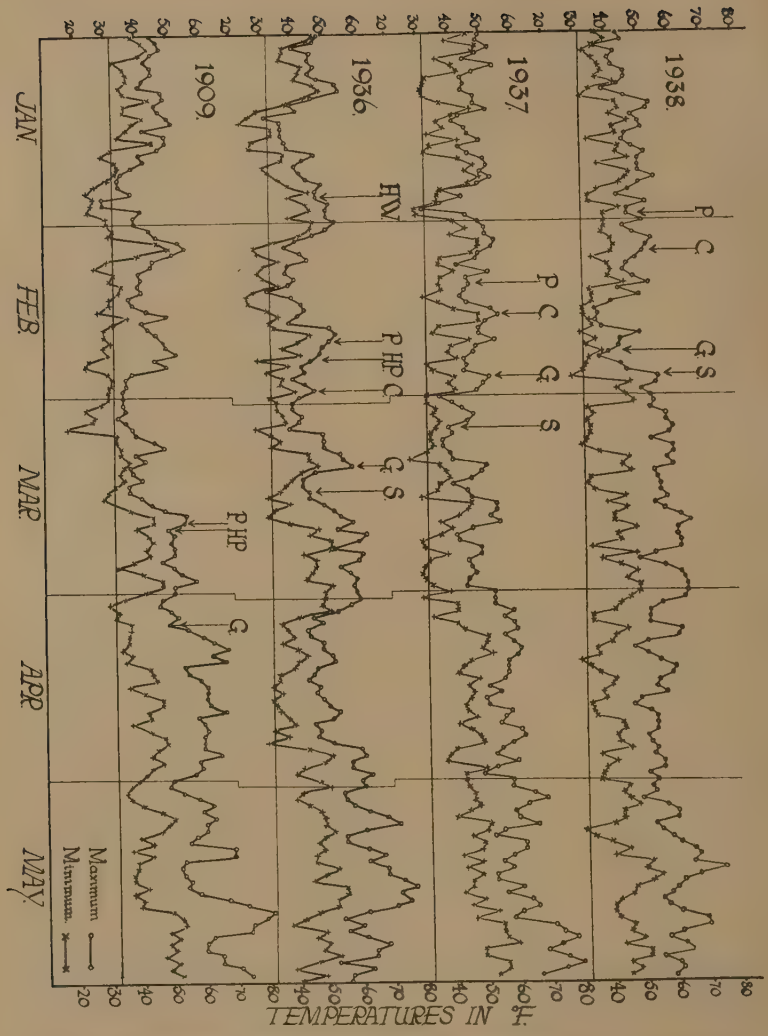

Fig. I. Maximum and minimun screen temperatures °F. at Kew Observatory and flowering dates of Elms and Common Hazel. Flowering dates are indicated by lettered arrows. P., *Ulmus procera*; C., *U. carpinifolia*; G., *U. glabra*; S., *U. stricta* var. *sarniensis*; H. W., Hazel (*Corylus Avellana* L.) at Wimbledon; H. P., Hazel at Purley. The freezing point, 32°F., is shown by transverse lines.

The time of flowering of the elms, as with other trees, is closely dependent on seasonal conditions among which temperature is probably the controlling factor. The seasonal variability of the time of flowering for one locality is indicated by the following dates on which specimens of open flowers of *U. glabra* growing at Kew were collected : April 6th, 1857 ; March 26th, 1858 ; March 12th, 1880 ; April 1st, 1892 ; March 20th, 1896 ; April 4th, 1900. These dates are taken from herbarium sheets. It is noteworthy that three out of the six dates fall in April, since *U. glabra* has not flowered as late as April for a number of years. The flowering dates noted at Kew for the stage of development represented by the herbarium material are, for the last three years : 1936, March 10th ; 1937, Feb. 25th ; 1938, Feb. 10th. In this series two dates fall in February, which is remarkably early for *U. glabra*, and doubtless due to the exceptional mildness of the winters of 1936–37 and 1937–38. Observations extending over the last few years show that elms of different species growing in the same locality usually flower in the same order. This phenomenon is common to other plants and makes it possible to predict the approximate date of flowering of related species in any year if the actual flowering date of one species is known. The order of flowering of the more important of the elms in cultivation at Kew is as follows : *U. procera* Salisb. ; *U. carpinifolia* Gleditsch (*U. nitens* Moench.) and hybrids of *U. carpinifolia* with *U. glabra* Huds. ; *U. glabra* and *U. stricta* Lindl. var. *sarniensis* (Loud.) Moss ; *U. laevis* Pall. and *U. americana* L.

The maximum and minimum daily screen temperatures at Kew Observatory for the months of January to May for the years 1909, 1936, 1937 and 1938 are plotted in Fig. I. The 32°F. level is marked by a horizontal line for each year so that the dates on which frosts occurred can be picked out readily. It is at once obvious that the early weeks of both 1937 and 1938 were exceptionally mild and in 1938 four degrees of frost was the maximum registered on but a single occasion in February. The weather of 1936 was colder, but the cold weather of January and February was broken by a warm frostless spell at the end of January lasting for ten days. This spell of mild weather evidently was sufficient to break the dormancy of the elm buds since *U. procera* began flowering immediately after the succeeding cold spell ending in mid-February. The records for 1909 show almost continuous night frost from mid-January until the first week of March. The frosts were much more severe than in 1936 with a maximum of 15 degrees on March 5th. In spite of the rigour of the weather it was interrupted by a mild spell of three frostless days in the first week of February. This short period cannot have been sufficient to break the dormancy of the elms for the subsequent hard frosts undoubtedly would have killed the flowers and prevented the abundant fruiting that followed.

The flowering times of four native species of elm for the years 1936–7–8 are indicated in Fig. I, by lettered arrows. The dates

shown are based on observations made at Kew and represent approximately for each species the times at which about half of the flowers in the majority of inflorescences had exserted stamens. The time of flowering of *U. glabra*, April 5th, indicated for 1909 is based in part on the unsatisfactory evidence of the herbarium sheet referred to above. The specimen was collected in Northants some time in April and it seems probable both from this and from the date on which the severe frosts ended that this species flowered during the first few days of April. This is not unlikely since older records of flowering dates in April have already been quoted for Kew. The date given for *U. procera* is a fortnight after the end of the hard weather and three days after the last severe frost on March 17th. The bulk of its flowers must have opened after March 17th for a frost of the severity of that occurring on this date probably would have killed the open flowers of this species, which actually fruited abundantly in 1909. In 1936 *U. procera* flowered about a fortnight after the end of the warm spell of the last week in January, but later frosts prevented the formation of fruit. Less severe frosts in 1937 killed all the flowers of this species before the end of February. All the evidence therefore favours the view that it could not have flowered before March 17th in 1909. From the records of 1936–38, *U. glabra* opens its flowers about 18 to 25 days after *U. procera*. On this basis, *U. glabra* should have flowered not earlier than April 6th in 1909, a quite satisfactory agreement with the date suggested. Further information favouring the suggested dates is obtainable from the Phenological reports of the Meteorological Society. Although elms are not mentioned, the common hazel, *Corylus Avellana* L., has similar flowering habits, and records of its flowering times are available for 1909 and 1936 for a number of stations. The nearest station to Kew with records for both years is Purley, where the hazel flowered on the 52nd day in 1936 and on the 79th day in 1909. These dates are respectively 3 days later than *U. procera* at Kew in 1936 and one day later than the suggested date for 1909. The actual flowering-date for the hazel at Kew would have been earlier and probably about the same time as that for Wimbledon where it flowered on January 26th in 1936.

If the flowering dates of *U. procera* and *U. glabra* are accepted as probably correct, the effect of the weather on flowering and fruiting in the four years under consideration may be examined further. Both 1938 and 1909 were remarkable for the abundance of the elm fruit on all species, but nevertheless the weather of the first three months differed widely in character. In 1909 almost continuous frosts lasted until March 5th while in 1938 the weather over the same period was unusually mild with only a few light frosts in February. This difference accounts for the great discrepancy in the flowering dates of the elms and makes it obvious that the actual date of flowering has no special significance so far as the setting of the fruit is concerned. Of much greater importance

is the occurrence and severity of night frosts after the flowers have opened. In 1938 the screen minimum reached 32°F. on three nights in the latter half of February and on February 25th four degrees of frost were registered. This frost may have reduced somewhat the total amount of fruit but probably came after the most sensitive stage of the young flowers was over. The year 1909 was comparable in having only a single frost of 2 degrees after the probable flowering date of *U. procera*. Several light frosts occurred during, and one six-degree frost just at the end of the flowering period of the elms in 1937 and there was scarcely a fruit to be found on any tree at Kew. It is probable that the six-degree frost was to a great extent responsible for this. Very little protection is needed however to prevent damage to the flowers by frost. Elm flowers that had been enclosed in paper bags to ensure self-pollination produced a fair number of fruits, a proportion of which were viable. A single layer of thin paper was capable therefore of preventing damage by a frost that probably exceeded six degrees in the open. Several frosts occurred during the flowering period in 1936 and no fruits were formed on *U. procera* and very little on *U. carpinifolia* or its hybrids with *U. glabra*. The only species that produced much fruit was *U. glabra* which flowered after the more severe of the frosts were over. On the evidence here presented, therefore, there appears reason to believe that frosts are in a large measure responsible for the failure of elms to fruit in most seasons. The species fruiting most frequently, *U. glabra*, is one of the latest to flower and is also one of the most hardy as indicated by its northern distribution in Europe.

Although there is little doubt that a single frost may do considerable damage when the flowers are in a sensitive condition, it is probable that continuous low day temperatures, especially if accompanied by dry winds, are of almost equal importance. The delicate tissues of the flowers are unable to withstand the excessive transpiration induced by such conditions. It can be seen from the graphs (Fig. I) that a spell of four days with a maximum day temperature of 36–38°F. occurred in February 1938, whereas in 1909 there was no cold weather at all after the elms began flowering. This may account in part for the somewhat smaller crop of fruit in 1938. Six cold days with maximum temperatures of 37–40°F. culminating with the six-degree night frost of March 10th 1937 probably helped to destroy the expanding ovaries in that year. Similarly, in 1936, the first five days of March with maximum temperatures of 38–42°F. probably added to the destruction wrought by the frosts.

One other factor that may affect the flowering of elms remains to be considered. The earlier observers previously mentioned, believed that the amount of sunshine during the preceding autumn affected the abundance of the flowers and " ripened the wood." The elm belongs to the group of early flowering trees that lay down

their flower initials during the preceding season. It is possible therefore for a bright sunny summer and autumn to affect the next season's flowering. The flower buds can be distinguished from vegetative buds by the end of August. It follows that the flower initials must be formed some time earlier and probably about the end of July or early in August. The weather conditions, especially the light intensity, for about a month preceding this date may also be expected to have some effect by controlling the amount of carbohydrate reserves stored prior to the formation of the flower initials. The only measurement of sunlight available is that of the Campbell-Stokes Sunshine Recorder, which records only the duration of bright sunlight. These records can serve as a rough indication of the conditions of illumination affecting photosynthesis and the accumulation of carbohydrate reserves.

TABLE I.—*Bright Sunlight and Temperature.*

Year.	*Total Bright Sunlight, hours.*		*Average Maximum Day Temperature, °F.*	
	Weeks 21–40.	*Weeks* 33–40.	*August.*	*September.*
1908 ...	935·0	302·0	67·7	64·0
1935 ...	885·5	268·0	73·3	65·6
1936 ...	720·1	264·4	71·1	65·5
1937 ...	814·0	287·3	74·2	65·2

The total number of hours of bright sunlight for the years concerned for the weeks 21 to 40, approximately May 23rd to October 2nd, and 33 to 40, approximately August 15 to October 2, are given in Table I with the average maximum temperatures for the months of August and September. The temperatures are probably not important as only a slight advantage is shown for August 1937 compared with 1908, while the September figures are nearly alike for all four years. The sunshine records show a definite advantage for 1908 over 1937 for the weeks 21–40, though the 1935 total exceeds that for 1937. These weeks include the whole period likely to affect the development of flower buds. The latter half of this period was also brighter in 1908 than in 1937. There can be no doubt that the total amount of sunlight in each year was quite adequate to produce a good crop of flowers the following spring, but the greater amount of sunlight in 1908 may have resulted in better development of the flower buds. Miller Christy records that the buds were unusually large in the autumn of 1908 and also says that in 1909 many trees did not produce their usual amount of foliage after the fruits had dropped. The principal reason for this was probably not exhaustion of the food reserves as he suggested, but the replacement of a large proportion of vegetative buds by flower buds. The flower buds never develop vegetative shoots after flowering and if the distal bud of a shoot becomes a flower bud as well as the larger laterals the shoot dies after flowering and is shed

in due course. It was noticed in 1938 that certain trees, especially forms of *U. glabra*, had less foliage than usual and on examination this was found to be due to the presence of many dead branchlets of the type here described. Although small lateral buds occur at the base of such shoots, the food reserves appear to be sufficiently exhausted by fruiting to prevent their development. In normal years the distal bud of the smaller branchlets is almost invariably vegetative and continues the growth of the shoot. It appears therefore that the bright weather of both 1908 and 1937 did actually increase the quantity of elm flowers to a slight extent. Also, the carbohydrate reserves in the trees probably were greater than usual, which may have contributed to the abundance of fruit in the following seasons, though no data are available to test this theory.

This examination of conditions under which mass fruiting of elms takes place indicates that frosts constitute the most important single external factor affecting the setting and early development of the fruit. Owing to the seasonal distribution of frosts the later flowering species normally stand the greatest chance of producing viable fruit. Conversely the earliest species, *U. procera*, has the least chance of producing viable fruit and in many seasons does not even develop sterile samaras. Though there were plenty of samaras in 1909 and in 1938, neither Henry nor the writer succeeded in growing seedlings from English seed of *U. procera*. It has been pointed out already that this species is not sterile, but conditions suitable for it to produce viable fruit in this country must occur at extremely rare intervals. Were it not for the freedom with which suckers develop, doubtless it would have become extinct long ago.

The writer is greatly indebted to Dr. F. J. Whipple of the Kew Observatory, Richmond, for the meteorological data used in this paper.

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XV—NOTES ON CAREX: VI.* E. Nelmes.

African Representatives of the Section Acutae.

The genus *Carex* has been divided by various authors into four subgenera. Kükenthal adopted these divisions, and in the Pflanzenreich he subdivides the fourth and largest of them, *Eucarex*, into 29 Sections (Sections 41–69). One of these is the Section *Acutae* Fries.

There are several points of interest about the *Acutae*. They form the first of the Sections in *Eucarex*; their species invariably bear plane-convex or biconvex utricles with two stigmas, whereas most

*Continued from K.B. 1939, 100.

of the members of all the other 28 Sections have more or less trigonous utricles and three stigmas ; and, it may be added, many of the *Acutae* are notoriously difficult to distinguish one from another. Among them is the well-known and polymorphic European and British species, *C. Goodenowii* Gay.

The Section *Acutae* is divided by Kükenthal into seven Subsections. The great majority of their species are plants of the north temperate regions, particularly of the colder parts, and are also numerous in the Himalayas.

Contained in Subsection 6 of Kükenthal's treatment, *Praelongae* Kükenth., are *C. Baronii* Baker and *C. madagascariensis* Boeck., both from Madagascar, and he describes the var. *austro-africana* under *C. cernua* Boott, citing seven gatherings from South Africa. In Durand & Schinz, Consp. fl. afr., and in Fl. cap., C. B. Clarke had identified these plants as *C. phacota* Spreng. They are, however, nearer to *C. cernua* Boott. This represented the known extent to which the *Acutae* had spread into Tropical and South Africa.

It is the main purpose of this note to record additions to the African *Praelongae*. The first of these was the discovery by Mr. Staples in 1936 in the Iringa Province of Tanganyika Territory of a species closely related to *C. madagascariensis*. Its description follows.

Carex papillosissima *Nelmes*, sp. nov. ; affinis *C. madagascariensi* Boeck., sed foliis latioribus, squamis oblongo-obovatis, utriculis squamis brevioribus, rostris longioribus crassioribus leviter bidentatis differt.

Culmus circiter 70 cm. altus, gracilis, inferne foliatus, laevis, triqueter, apicem versus scabriusculis. *Folia* 4–5 mm. lata, inflorescentia breviora, superne plana, inferne conduplicata, disticha, culmorum basin versus conferta, subrigida, marginibus superne scabriuscula ; vaginae superiores castaneae, inferiores pallidiores. *Spicae* 5, terminalis mascula, 3·5 cm. longa ; ceterae femineae, interdum leviter androgynaeceae, tenuiter cylindricae, subdensiflorae, cernuae, 5–6 cm. longae, circiter 4 mm. latae, infima remotiuscula excepta subapproximatae, fastigiatae, superiores pedunculatae, inferiores longipedunculatae ; pedunculi filiformes laeves. *Bracteae inferiores* foliaceae, inflorescentiam superantes, breviter vaginantes, superiores vix foliaceae, evaginantes. *Squamae femineae* oblongo-obovatae, apice bilobo-emarginatae, 3 mm. longae (arista 1·5 mm. inclusa), lobi albo-hyalini excepta ferrugineae, e vitta mediana pallide trinervi in aristam planiusculam scabro-marginatam excurrentes. *Utriculi* 2·5 mm. longi, late ovato-elliptici, squamis latiores, biconvexi, olivacei, tuberculis albidis vel pallide brunneis dense conspersi, enervii vel 1–3 nervosi non percursi, in rostrum breve albidum ore subintegrum abrupte contracti. *Stigmata* 2.

Tanganyika Territory : Iringa Province, Sau, circa 1800 m., 27 October 1936, *Staples* 416.

The second additional African member of the Subsection was discovered by Mr. E. Milne-Redhead in Northern Rhodesia in 1937.

This plant is, in my opinion, specifically distinct from *C. cernua* Boott, a Himalayan sedge to which it appears to be most closely related. The chief differences lie in its terminal spike, which is wholly male instead of gynaecandrous, and in the utricle, which passes abruptly, not gradually, into a short beak.

C. cernua Boott var. *austro-africana* Kükenth. is considered to stand rather nearer to *C. cernua* than to this new Rhodesian plant. The utricle of Kükenthal's variety scarcely differs from that of *C. cernua*, its terminal spike is sometimes wholly male and sometimes gynaecandrous, and its only striking and consistent difference from the species lies in its much longer glumes.

Carex rhodesiaca *Nelmes*, sp. nov.; affinis *C. cernuae* Boott, sed spica terminali mascula, utriculis non marginatis abrupte rostratis differt.

Rhizoma caespitosum et breviter stoloniferum. *Culmi* 47–65 cm. longi, validi, acutanguli, inferne laeves, angulis apicem versus scabridis, foliati. *Folia* 5–7 mm. lata, plana, rigida, pallide flavovirides, marginibus scabris; vaginae ferrugineae, vix reticulatim fissae. *Spicae* 5–7, 1·5–3·5 cm. longae, terminalis mascula, linearicylindrica, pedunculata; ceterae femineae, cylindricae, superiores subapproximatae et breviter pedunculatae, inferiores subdistantes et longius pedunculatae, cernuae; pedunculi tenues, scabri. *Bracteae* foliaceae, inferiores inflorescentiam longe superantes, vix vaginantes. *Squamae femineae* oblongo-obovatae, apice truncatae vel emarginatae, tenuiter membranaceae, albidae, ferrugineo-maculatae, e dorso latissime straminei trinervi in aristam longam planam validam parce hispidam excurrentes. *Utriculi* squamas (arista inclusa) plerumque aequantes sed latiores, late elliptici, compresso-biconvexi, 3–3·5 mm. longi, brunneo-olivacei, dense minute papillosi, enerves, basi subtruncata, brevissime obconico-stipitati, in rostrum breve cylindricum laeve ore subintegrum abrupte contracti. *Nux* obovata. *Stigmata* 2.

Northern Rhodesia. Mwinilunga District, by R. Lunga just E. of Mwinilunga, in muddy pockets of rock, full of water, 27 November 1937, *Milne-Redhead* 3422.

XVI—THE CORRECT NAME FOR SESBANIA ACULEATA.

T. A. Sprague and E. Milne-Redhead.

This widely distributed species is best known as *Sesbania aculeata*, the name adopted for it in most floras and monographs, a selection of which follows:—DC. Prodr. **2,** 265 (1825); works dealing with Asiatic botany, e.g. Wight and Arn. Prodr. **1,** 214 (1834); Hook. f. Fl. Brit. Ind. **2,** 114 (1876); Trimen, Handb. Fl. Ceylon, **2,** 34 (1894); Prain in Journ. As. Soc. Beng. n.s. **66,** pt. 2, 369 (1897); Gagnepain in Lecomte, Fl. Gén. Indo-Chine, **2,** 411

(1916) ; Gamble, Fl. Madras, **1,** 323 (1918) ; Alston in Trimen, l.c. **6,** 76 (1931) ; works on Australian botany, e.g. Benth. Fl. Austral. **2,** 213 (1864) ; Moore and Betche, Handb. Fl. N.S. Wales, 149 (1893) ; Bailey, Queensl. Fl. **2,** 398 (1900) ; J. M. Black, Fl. S. Austral. 317 (1924) ; C. A. Gardner, Enum. Pl. Austral. Occ. 64 (1931) ; works on African botany, e.g. Harv. and Sond. Fl. Cap. **2,** 212 (1861–2) ; Oliv. Fl. Trop. Afr. **2,** 134 (1871) ; Engl. Pflanzenw. Ost-Afr. C, 213 (1895) ; Phillips and Hutch. in Bothalia, **1,** 50 (1921) ; Hutch. and Dalz. Fl. West Trop. Afr. **1,** 387 (1928) ; E. G. Baker, Legum. Trop. Afr. 262 (1929).

In 1920 Fawcett and Rendle (Fl. Jam. **4,** 24) adopted for this species, and thus validly published, the combination *Sesbania bispinosa* (Jacq.)*, attributing it to Steudel, who, however, had merely cited it as a synonym. Rydberg (North Amer. Fl. **24,** 203 : 1924) made, under *Sesban* Adans., the "new combination" *Sesban bispinosus* (Jacq.) Rydb. This, however, is perhaps best regarded as an orthographic variant of *Sesbania bispinosa*. Urban (Symb. Antill. **9,** 450 : 1928) adopted *Sesbania bispinosa*, attributing it to Steudel. Other recent authors seem to have overlooked Fawcett and Rendle's adoption and valid publication of the name.

Prain (l.c.) identified *Sesbania aculeata* with *Coronilla cochinchinensis* Lour. (1790), treating *S. cannabina* as a distinct species, whereas Merrill (Trans. Amer. Phil. Soc., n.s. **24,** pt. 2, 197 : 1935) identified *S. aculeata* with *Aeschynomene cannabina* Retz. (1789), treating *S. cochinchinensis* as a distinct species.

Both epithets, *cannabina* and *cochinchinensis*, antedate *bispinosa*. Hence the correct name of *Sesbania aculeata* depends on taxonomic interpretation.

We consider that *S. aculeata* is not conspecific with *S. cannabina*. The description of *Aeschynomene cannabina* by Retzius includes the words "foliola . . . . pilosa," which apply to the species named *Sesbania cannabina* by Prain (l.c. 368) and Gagnepain (l.c. 410). Merrill considered that Jacquin's figure of *Aeschynomene bispinosa* (Ic. Pl. Rar. **3,** 13, t.564 : 1793) could not be distinguished from *S. cannabina*, stating that the pods are *non-torulose*. But Jacquin not only described (Coll. **2,** 284 : 1788, as "*Aeschynomene Sesban*") the pods as torulose, but figured a distinctly torulose mature pod. Furthermore, the length of the pods and that of their beak, and Jacquin's description of the leaves as glabrous, convince us that his plant is conspecific with those described by Prain and Gagnepain under the name *Sesbania aculeata*.

The identification of *Coronilla cochinchinensis* Lour. offers more difficulty. No type-specimens are extant so far as is known, the 37 Loureiro specimens, including *C. cochinchinensis*, formerly in the Museum of the Academy of Sciences at Lisbon, having been destroyed between 1865 and 1874 (Merrill, l.c. 14, 20–22). *Coronilla cochinchinensis* is not included in the list of Loureiro specimens at Paris

* Based on *Aeschynomene bispinosa* Jacq. (1793).

(Merrill, l.c. 15–18), and Mr. A. W. Exell informs us that he has not succeeded in tracing a Loureiro specimen of it in the British Museum.

Loureiro's description of his *Coronilla cochinchinensis* is, in our opinion, insufficient to identify the species with certainty. He describes the peduncles as sub-triflorous, the pods as erect, straight, filiform, long and torulose, and the leaflets as provided with a slender cusp. Of the five species of *Sesbania* known from Indo-China (Gagnepain, l.c. 407–412), the first three are excluded by Loureiro's description of the fruits as torulose, so that only no. 4, *S. aegyptiaca* * and no. 5, *S. aculeata*, come into consideration. The *erect, straight* pods suggest *S. aegyptiaca*, whereas the *slender cusp* of the leaflets suggests *S. aculeata*. Both species are sometimes few-flowered, and both have long filiform pods. The simplest explanation of these discrepancies is that Loureiro included more than one species under *Coronilla cochinchinensis*. A. P. De Candolle (Prodr. **2**, 266 : 1825) treated *S. cochinchinensis* as a *species dubia*. The different conclusions reached by Prain and Merrill as to the specific identity of the fine plate and description of *Aeschynomene bispinosa* Jacq. show how difficult it is to identify species of *Sesbania* without herbarium material. In the circumstances we reject the name *Sesbania cochinchinensis* (Lour.) DC. as a *nomen dubium* (Internat. Rules, ed. 3, Art. 63).

The correct name for *Sesbania aculeata* appears to be *Sesbania bispinosa* (Jacq.) Fawc. et Rendle. As pointed out by Alston (Trimen, l.c. **6**, 76), the earliest validly published name for the species is *Aeschynomene aculeata* Schreb. (1770), but Schreber's epithet *aculeata* cannot be adopted under *Sesbania*, since the resulting binary combination would be a later homonym of *S. aculeata* (Willd.) Pers., since it was based on a different type (Internat. Rules, Art. 61).

Aeschynomene aculeata Schreb. was a new species based on a plant raised at Halle by Schrader from seed received from Malabar. *Coronilla aculeata* Willd. was merely a new name for *Aeschynomene bispinosa* Jacq. and appears to have no connexion whatsoever with *Aeschynomene aculeata* Schreb. It was illegitimate, since Willdenow ought to have retained the epithet *bispinosa*. *Ae. bispinosa* Jacq. was a new species based on a plant cultivated at Schönbrunn, which Jacquin (Coll. **2**, 283 : 1788) had previously misidentified with *Ae. Sesban* L. and described in detail under that name.

For purposes of nomenclature, the epithets *aculeata* Schreb. (1770) and *aculeata* Willd. (1803) are different. Although they are regarded as representing the same species, this is merely a matter of taxonomic opinion. *Aeschynomene aculeata* Schreb. is at present treated as a taxonomic synonym of *Sesbania aculeata* (Willd.), but this judgment might be reversed. On the other hand, *Coronilla aculeata* Willd. and *Sesbania aculeata* (Willd.) are absolute, i.e. nomenclatural, synonyms of *Aeschynomene bispinosa* Jacq. and *Sesbania bispinosa* (Jacq.), all four names being based on the same

* The correct name for *S. aegyptiaca* Pers. is *S. Sesban* (L.) Merr.

type. This distinction between taxonomic and nomenclatural synonyms explains the apparent anomaly of two names being homonyms* although they are applied to the same species by taxonomists.

The case of *Sesbania aculeata* illustrates the vital importance of the " double citation " (Art. 49), in which the original author of an epithet is cited in brackets followed by the name of the transferring author.

The correct name under International Rules and the synonymy of *Sesbania aculeata* are accordingly as follows :—

Sesbania bispinosa (*Jacq.*) *Fawcett & Rendle*, Fl. Jam. **4,** 24 (1920).
Aeschynomene aculeata Schreb. in Nov. Act. Cur. **4,** 134 (1770).
Aeschynomene Sesban L. sec. Jacq. Coll. **2,** 283 (1788), non L.
Aeschynomene bispinosa Jacq. Ic. Pl. Rar. **3,** 13 (1793).
Coronilla aculeata Willd. Sp. Pl. **3,** 1147 (1803), nom. illegit.
Sesban aculeatus (Willd.) Poir. Encycl. Meth. **7,** 128 (1806) nom. illegit.
Sesbania aculeata (Willd.) Pers. Syn. **2,** 316 (1807), nom. illegit.

XVII—MISCELLANEOUS NOTES.

Liaison Officer for the Commonwealth of Australia.—Mr. C. T. White, Government Botanist, Brisbane, has been appointed Liaison Officer for the Commonwealth of Australia and commenced work in the Herbarium on March 7th. Mr. C. A. Gardner, who has been working in the Herbarium as Liaison Officer since March 11th, 1937, left Kew on January 28th, 1939, to return to his post as Government Botanist, Department of Agriculture, Perth.

Carl Schröter.—We have to record with deep regret the death at Zürich on 7th February, 1939, at the age of eighty-four, of Professor Carl Schröter, one of the most distinguished European botanists in many fields of work. Professor Schröter was working actively to the end, having taken part, as Honorary President, in the January Session of the Commission of the Scientific Investigation of the Swiss National Parks. His excellent handwriting was as firm and clear as ever in a letter written to Kew on January 10th.

Carl Schröter was born in Esslingen, near Stuttgart, in 1855. His father, Prof. Moritz Schröter, was a native of Austria, and Switzerland became Carl Schröter's adopted country after the family moved to Zürich. Schröter studied under Cramer and Ostwald Heer, and also under Eichler and Schwendener at Berlin. He was appointed Docent in 1878, obtained his doctorate in 1880, and became Professor of Systematic Botany at the Eidenössische Technische Hochschule in 1883, a post he held until 1925, when he retired at the age of seventy.

Schröter was a brilliant teacher and lecturer. Botanical excursions played a large part in his teaching and he had an intimate

* A homonym is the same name applied to a different type.

field knowledge of the native Swiss flora. On these excursions he enlivened the proceedings with his songs and keen sense of humour. He was the life and soul of the international phytogeographical excursion to Algeria and Morocco in the spring of 1910, which was attended by Prof. Tansley, Sir Arthur Hill and the late C. E. Moss. His boyish enthusiasm and delight in the beauty of the flowers, especially at Oran, will not be forgotten by those who were with him. At the age of seventy, on his retirement, he went on a voyage to South Africa and the Dutch East Indies.

Schröter's chief field of scientific work was ecological plant geography, which culminated in the publication of " " Pflanzenleben der Alpen," a second edition of which appeared in 1926. His many scientific papers included ecological studies of the Swiss grasslands and moors, work on fossil woods, on the flora of the Swiss lakes, and many monographs on single species and areas. He also published a Pocket Flora for Alpine Travellers.

Schröter did much work for the popularisation of botany in Switzerland and was a strong supporter of the Zürich Volkhochschule. One of his chief interests was the preservation of Nature in Switzerland, and he was concerned in the foundation of the " Federation for the Protection of Nature " and the Swiss National Park in the Engadine.

Schröter received many honours from foreign Universities, including an Honorary Doctorate of Science at Cambridge during the International Botanical Congress of 1930, which he highly valued.

H. Brockmann-Jerosch.—We have received with great regret the news of the death of Prof. H. Brockmann-Jerosch as the result of a motor accident on 14th February, 1939. Prof. Brockmann-Jerosch was born on the 23rd May, 1879 at Winterthur and was educated at the Polytechnic and University of Zürich. He became professor of geography in the Oberrealschule of Zürich and Titular-professor of the University. His activities in connexion with the preservation of the Swiss flora and fauna were many and he was also a recognized authority on Swiss folk-lore and peasant houses. His principal botanical publications were : " Die Flora des Puschlavs und ihre Pflanzengesellschaften " (1907), " Die fossilen Pflanzenreste des glazialen Deltas bei Kaltbrunn " (1912), and " Baumgrenze und Klimacharakter " (1919).

Prof. Brockmann-Jerosch attended the International Botanical Congress at Cambridge in 1930. Latterly he had taken an important part in attempts to arrange for the preparation of a vegetation map of Europe. His untimely death results in a great loss to ecological and phytogeographical botany. W. B. TURRILL.

Wild Flowers of Australia.*—Miss Harris, who is lecturer in biological sciences at the Teachers' College, Sydney, is well known

*By Thistle Y. Harris, B.Sc. (Syd.). Angus & Robertson, Ltd., Sydney. Pp. 198+xix, with 65 coloured plates.

in Australia as an enthusiastic field botanist who has done much to encourage the study of wild life, particularly the plants, among the teachers and school children of New South Wales. The illustrations from the brush of the late Adam Forster are pictorial gems and vividly portray 248 Australian wild flowers. The book is divided into two parts ; the first gives a brief description, the distribution and the time of flowering of each species depicted ; the second is a key, but only covers the flowers illustrated. The title is rather ambitious, as of the 248 plants figured 215 are found in New South Wales, though of these about 170 extend into Queensland and 115 into Victoria ; many of the plants, therefore, have a wide range in Eastern Australia, but Tasmania, South Australia and Western Australia are poorly represented. The wild flowers of the last mentioned state, which have a wide reputation for their variety and beauty, are only represented by 33 species. The book, however, can be strongly recommended as a reliable popular guide to the most important wild flowers of extra-tropical eastern Australia. The price of the work is not indicated on the outside wrapper.

C. T. WHITE.

Alpine Flowers.*—This volume provides a most delightful picture gallery of a selection of well-known alpine flowers. The original water-colours of Paul A. Robert have been reproduced on the 10-colour Iris Press of the Polygraphische Gesellschaft of Laupen, Berne, and the result is a very successful combination of natural effect and formal design. The plates are not all of equal merit, and one or two criticisms can be made. For example, some of the greens are poor (notably plates 3 and 14), while many of the pictures lack depth (*e.g.* plates 10 and 19). On the whole, however, they form one of the most attractive sets of wild flower illustrations that we have seen, and they should have a wide sale at the moderate price of ten shillings. Perhaps the best of the thirty-six plates are *Ranunculus alpestris* (pl. 29), *Carlina acaulis* (pl. 15), and *Papaver alpinum* and *Linaria alpina* (pl. 25). The late Professor Schröter has written notes to each plate and an introduction on the Alpine Flora which he knew and loved so well.

Botanical Magazine.—Part 4, the concluding part of volume 161, was published on 27th March. This is prefaced with a portrait of the late Dr. A. B. Rendle, F.R.S., to whom the volume is dedicated, and contains the following plant portraits : *Rhododendron Elliottii* Watt ex Brandis (t.9546), a fine scarlet-flowered species found on Mount Japvo, Assam ; *Dracocephalum Hemsleyanum* (Oliver ex Prain) Prain ex Marquand & Airy Shaw (t.9547), from S.E. Tibet ; *Prunus mira* Koehne (t.9548), introduced from western

*" Alpine Flowers." 36 colour plates from water-colours specially prepared by Paul A. Robert. With an Introductory Text by Prof. Dr. Carl Schröter. B. T. Batsford, Ltd., London, 1938. Pp. 11, 36 coloured plates. Price 10*s*.

Szechwan by E. H. Wilson; *Arisaema candidissimum* W. W. Sm. (t.9549), an interesting species with soft pink and green spathe, found by Forrest in N.W. Yunnan; *Callitris oblonga* L. C. Richard (t.9550), native of Tasmania; *Anemone biflora* DC. (t.9551), a beautiful deep-red-flowered species with persistent sepals received from Mr. A. C. Trott from Persia; *Solanum valdiviense* Dun. (t.9552), a shrubby species with sweetly-scented, mauve or whitish flowers, from Chile and the Argentine; *Ania Hookeriana* (King & Pantl.) Tang & Wang (t.9553), native of Sikkim and N. Siam; *Cotoneaster conspicua* Comber ex Marquand (t.9554), collected by Captain Kingdon Ward in S.E. Tibet; *Romulea Requienii* Parl. (t.9555), from Corsica and Sardinia; and *Campanula incurva* Auch. ex A.DC. (t.9556), a fine species with mauve or pale-violet flowers found on the mountains of Thessaly and Euboea.

The Birds of Tropical West Africa.*—This beautiful and very interesting volume, the fifth of the series, describes and figures the second part of the Passeriformes including the warblers, swallows, cuckoo-shrikes, orioles, drongos and true shrikes, illustrated by ten coloured plates each containing a number of birds, many figures in black and white and two maps. Unlike many descriptive ornithological works the author gives the fullest available details of the habits, cries, nesting and food of the birds, derived from his numerous correspondents in Tropical Africa. These observations are of special interest in the case of the numerous summer migrants to this country such as the chiffchaff, garden warbler, blackcap, swallows and martins, as completing the history of the habits of these birds.

The work was written at the Natural History Museum and the expense of these exquisite volumes paid for by the four West African Colonial Governments. Two more volumes are to be brought out, one dealing with the titmice, crows, starlings and whiteeyes, and the other with weavers, buntings, and finches.

Mr. Bannerman is to be heartily congratulated on his laborious and valuable work. H. N. RIDLEY.

Hardy Bulbs.†—We have recently received a copy of the second and third volumes of Colonel Grey's work on Hardy Bulbs. Vol. 2 covers the families Amaryllidaceae, Commelinaceae, Haemodoraceae, Orchidaceae and Scitamineae, and vol. 3 Liliaceae. The general scope of the work was outlined in a previous notice (Kew Bull. 1938, 170). In vol. 3 the author has had the advantage of

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* Vol. V. By David A. Bannerman. Published by the Crown Agents for the Colonies, 4, Millbank, London, S.W.1. 1939. Price 22*s*. 6*d*.

† "Hardy bulbs: including Half-hardy Bulbs and Tuberous-rooted plants." By Charles Hervey Grey, Lt.-Col., D.S.O., F.L.S. Vols. II. Amaryllidaceae, Commelinaceae, Haemodoraceae, Orchidaceae, Scitamineae. pp. viii+368. 47 pls. Price 30*s*. Vol. III. Liliaceae. Pp. x+664. 82 pls. Price 45*s*. London. Williams & Norgate, Ltd., 1938.

being able to incorporate a considerable amount of recent research on several important garden genera such as *Allium, Fritillaria, Hosta, Lilium, Nomocharis* and *Tulipa*, so that an up-to-date treatment of these genera can be presented.

We congratulate Colonel Grey on the completion and successful publication of his great essay, and on his wish to provide a treatise on these delightful plants for the horticultural world. His three volumes on hardy bulbs are likely to prove to be far the most useful general work on Monocotyledonous plants for the garden for very many years.

German without tears.—In the good old days of the middle ages Latin was the usual medium for the recording of scientific work. It is not without significance that taxonomy is the only branch of botany retaining Latin by international agreement for purposes of description, and even in taxonomy its use is becoming more and more restricted to the formal publication of new groups. Most botanical work at the present time is published in the vernacular and more in English and German than in any other two languages. Many of those who write the body of their papers in some other tongue frequently add a summary in English or German, and the best-known journals devoted to abstracts of published work are in one or other of these languages. It follows that every botanist must have a working knowledge of English and German and be able to use works in either. This involves more than a mere knowledge of the grammar and "basic" words. In English, the tendency is for scientific terms to be coined from Greek or Latin. In German, on the other hand, such terms are often built up from pre-existing German words, sometimes making terms which seem to an Englishman rather cumbrous—carbohydrates is bad enough, but Kohlenwasserstoffverbindungen seems worse, though this may be due merely to the inherent laziness of an Englishman.

To know a foreign language so completely as to be able to speak it fluently and to appreciate all its subtleties is possible only for a small number of botanists. Exactly what is the best way of obtaining a sufficient basis for general research is somewhat doubtful, and no doubt varies with the individual. It is probable that the method used in a recently published book* will form a good introduction to German for English readers and to English for German readers within the realm of botany. It has been compiled by two English (Dr. H. and Prof. E. Ashby) and two German (Dr. H. Richter and Dr. J. Bärner) biologists. A wide range of subjects is included—morphology, classification and phylogeny, cytology and genetics, physiology, ecology, and plant pathology. The general method is to print the English text on the left-hand page and the corresponding German text on the right-hand page. How far such

* German-English Botanical Terminology (Englisch-deutsche botanische Terminologie), Thomas Murby & Co., London, 1938, 10*s*. net, pp. 195.

a convenient " crib " is conducive to retention of the foreign tongue may be disputed. The scheme shows some resemblance to certain psychological tests for honesty. It may be suggested that " translation " would be a more appropriate word than " terminology " to use in the title. The selection of material and the translations appear, on the whole, to be excellent. English, Latin and German names of common wild and cultivated plants are given in Appendix I, and of plant diseases in Appendix II. English and German Indexes complete the book. W. B. TURRILL.

The Vegetation of South Africa.*—Ever since Drege's celebrated pioneer work appeared in 1843 the floral regions of South Africa have engaged the attention of many botanists. Bolus' " Sketch of the Floral Regions of South Africa " summarised the knowledge of the subject in 1905, and since then further accounts have been published by the late Dr. Marloth and by Dr. Pole Evans. All these authors, particularly the last mentioned, travelled extensively and made large herbarium collections, so that Professor Adamson has had an abundance of information for his compilation of this small handbook.

Three chapters, extending over 86 pages, are devoted to accounts of the physiography, climate and weather, and geology and soils. For the well known " Cape bush," " fynbos " or " macchia " of the South Western Region, the term " sclerophyll " is used. It contains very few plants of use to man, the *Proteaceae*, *Bruniaceae*, *Restionaceae* and others peculiar to South Africa, being the principal families represented in the area. The " rhenosterbush," *Elytropappus rhinocerotis* Less., covers wide tracts and is the most arid kind of " sclerophyll."

Forest vegetation occupies only 0·3 per cent. of the whole Union, and Adamson recognises four subdivisions: (1) temperate forest; (2) warm temperate forest; (3) subtropical forest; and (4) montane forest. The highest trees of the temperate forest, such as occurs at Knysna and the Zitzikama, are *Podocarpus* (up to 150 ft.), and in this area is the " stinkwood," *Ocotea bullata* E. Mey. (*Lauraceae*), from which beautiful furniture is made.

The soils of the subtropical forest, which occurs in the eastern part of the Union, are deep and very fertile, and the main crops are maize, Kaffir corn, sugar, tea and cotton, besides bananas, pawpaws, mangoes, pineapples and avocado pears.

Certain floral regions of other authors are classed together under the heading " savanna vegetation." This includes the " Acacia-grassland " of Natal, the " Bush-veld " of the northern half of the Transvaal, and the " Low-veld " of the north-eastern Transvaal. This is perhaps not a very happy association, and embraces very distinct regions, especially the last mentioned.

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* " The Vegetation of South Africa." By R. S. Adamson (Monographs of British Empire Vegetation). London: British Empire Vegetation Committee, 1938. Pp. xvi+235+9 plates. 10*s.* net.

Chapters devoted to "Grass-land" (High-veld), and "Semi-desert (Karoo) follow, and the book concludes with a short account of land utilization and natural products, and a most interesting chapter entitled "General Conclusions and Prospects."

The book is remarkable in two respects. It required some skill to compress into less than 150 pages an account of so vast a region with an exceptionally rich flora (probably about 15,000 species), and it is nowhere camouflaged by excessive use of ecological terms which so often render similar accounts difficult and even uninteresting from the general reader's point of view.

J. HUTCHINSON.

The Correct Name of the Common Parsley.—In K.B. 1938, 257, the following statement occurs: "The epithet *crispum* . . . was (as noted by Wolff) employed under this genus [*Petroselinum*] *in synonymy*, for some unexplained reason, by Nyman, Consp. Fl. Eur. 309 (1879)." My attention has recently been drawn to the explanation of the abbreviations and signs used in the "Conspectus," at the foot of the last page of the introductory remarks. This states that a long dash (—) preceding a name indicates a variety: "varietates [notantur] linea longiori (—) ante nomen." The citation "—P. crispum (Mill.)" under *P. sativum* therefore means that Nyman regarded *Petroselinum crispum* (Mill.) as a *variety* of *P. sativum*. His use of a binary nomenclature for sub-divisions of species is, however, not admissible (Art. 28). The binary combination *P. crispum*, being cited by Nyman under *P. sativum*, was in effect treated by him as a *specific* (though not *varietal*) synonym of the latter and was therefore not validly published. Nyman's "varietal binomial" being therefore ruled out, the first valid use of the combination *Petroselinum crispum* (i.e., for a *species*) is apparently in the Kew Hand-List of Herbaceous Plants, 122 (1925), and the attribution to Nyman may be taken as a validating reference to Nyman's well-known work, where the author of the name-bringing synonym, *Apium crispum* Mill., is cited in brackets. There is clearly no doubt as to the plant intended either by Nyman or by Miller, nor as to the works of those authors intended by the Kew Hand-List and by Nyman respectively.

The article in Kew Bull. l.c. should accordingly be amended as follows:—

Line 13: *delete* " for some unexplained reason ".
Line 15: *after* " But the combination " *insert* " *P. crispum* ".
Line 24: *for* " pro syn." *read* " pro var."

It is suggested that the species will be conveniently cited as **Petroselinum crispum** (*Mill.*) *Nym. ex. auct. kew.*

H. K. AIRY-SHAW.

Printed under the authority of His Majesty's Stationery Office
By the South Essex Recorders, Ltd., Ilford.
(702) Wt. 17/82 800 5/39 S.E.R. Ltd. Gp. 381